No Menace from Increased Kraft Production

THE paper industry and particularly the kraft division has been getting some general publicity lately most of which makes news and as such is readable because it depicts an unusual situation. For instance, the reading public is intrigued by articles which claim there is "too little" or "too much" of any commodity.

Now the latest "news" is that there is "too much kraft paper." The fact is, there is "too little kraft paper." Where the disparity between "news" and "facts" arises is that the news reporter does not differentiate between "kraft production" and "kraft paper." There is an enlarged and increasing prospective tonnage of kraft production coming on the market within the next two years. Of that increased kraft production less than 11 per cent is kraft paper and of that 11 per cent almost 9 per cent is kraft bag paper, and 2 per cent may be wrapping paper.

For the past year or more the public has been hearing of this large kraft production coming in, south of the Mason and Dixon's Line. The total has all been credited to kraft paper tonnage, which is highly erroneous. For the whole kraft production program in the South has shifted in the past ten years from kraft paper to kraft liner board mainly.

In 1927, there was a total of 84,100 tons of kraft liner boards made in the mills of the South. In 1936, these same mills made 884,900 tons and the only reason they did not make more was because they had reached their 100 per cent of capacity production, hence the development of new kraft production projects in that territory. The essential fact for the public to keep in mind is that this new production will go mainly in liner boards and not into kraft paper.

Another great factor which seems to have escaped the attention of the general paper consuming public, is that the whole program of kraft production in the South is predicated upon a mass production basis. Now there are only four divisions of the paper industry's classification in which mass production is possible. They are kraft pulp, kraft liners, kraft bag paper and news. What we mean by mass production is that production of tonnage which permits a mill to run 500, 1000 or even 2000 tons of one grade, one finish, one weight, one color of product continuously and without change or interruption. Kraft pulp mills? Yes! Kraft liner board mills? Yes! Kraft bag paper mills? Yes! Mass kraft production is the program set for the Southern mills. It is economic and sound and has come to stay.

The balance of the industry's classifications of papers fall into the "specialty" divisions. Specialty papers are the particular product of the Northern small machine mills and have no place whatever in the Southern mill set-up.

So to our way of thinking, after careful study and analysis of the Southern situation, we can forsee no condition on which a conclusion that "too much kraft paper" is in prospect. On the contrary, we can see where a drastic shortage of kraft paper is imminent for the demand for kraft paper has increased and is enlarging every year, as the statistics of the industry conclusively show, but that is another story in itself and a most interesting one at that.

+ EDITORIAL +

Creative Thinking

ROBERT F. HELLER in an article which appeared in the July 5, 1937, issue of *Steel* under the title, "What Can I Do to Make Them Think?" comments helpfully on a subject that is of vital interest to every executive. What he has to say applies equally well to executive and employee alike. So potent and fundamental are some of his remarks that the liberty is being taken of passing them along to you in the way that Mr. Heller expressed them. Here they are:

"The day when one or two men can do all the thinking for an organization has definitely passed. Business has grown too complex, too intricate, for the heads of a business to be able to do the thinking on every individual operation throughout the plant. Important phases of management, selling and finance may command the bulk of your business hours. The thinking you are doing is along broad creative lines. You are the architect building a business; your key employees are the contractors and subcontractors.

"Yet, one idea from an employee—one well thought-out suggestion—may profitably improve the whole design of your business structure. How can you get these men to offer ideas and suggestions? How can you make them think?

"Have you ever stopped to analyze what makes you think and what has influenced the new ideas you have developed for your firm during the past 10, 15 or 25 years?

"Suppose in all that time you had never seen a business paper, had never read an article related to your business, never analyzed your production setup in comparison with others described from time to time, never picked up a short cut or money-saving idea from a trade paper, and never had looked at a helpful piece of direct mail advertising. In short, suppose during your entire business career you had never done any reading related to your business. How do you suppose it would have affected your thinking?

"Would your plant and methods be as modern as they are right now? Would you know all the things you know today if you had not done your share of reading during those years of building?

"The answer is obvious. Reading does exercise a powerful influence on our thinking. It stimulates us from outside of ourselves. It pours ideas into our minds that tumble around and take shape, to our benefit and profit. It spurs us on, shows us new and easier ways of doing things and encourages us to think and apply the things we read."

In addition to these comments, Mr. Heller called attention to five steps which can be taken to bring about more original thinking within any industrial organization. They are steps familiar to most executives but they will bear repeating—cut the red tape; encourage the reading of business papers; see that business papers circulate and are read; ask for suggestions; and send them visiting.

Such suggestions, simple as they are, when put to work cannot help but yield dividends.

A Permanent Reference

SOME books are read only to be discarded. A single reading for enjoyment is all of the attention that they can command. They are attention-getters but not attention-holders. They live only for a day and tomorrow are forgotten. How many of the popular books of the past year, for example, books that were advertised and talked about, can you call by name quickly and without hesitation? How many of the authors can you remember?

There are other books, however, that live. They can be read over and over again with added pleasure and profit with each succeeding reading. These books may be fiction or non-fiction, technical or non-technical, but there is something about them that causes them to be kept and to be referred to time and time again.

Every papermaker from the top executive to the aspiring worker in the mill should have a library that would serve as a permanent source of reference material relative to the industry of which he is a part. The library might be either large or small, extensive or limited in scope, but should be developed to meet the individual needs of the owner.

Within only the past few years the literature of the industry has become rather extensive. Now it is possible to obtain a number of highly specialized books on the subject. At the same time, the magazine literature of the trade contains a vast fund of knowledge which, if properly utilized, will make for a better and more efficient industry.

The Paper Industry, for example, was founded for the purpose of serving the pulp and paper industry in an educational way. Its articles are highly instructive and helpful. They cover a wide variety of subjects and yet are very specific in scope. They treat of the kind of material that should be kept for permanent reference.

Many of the readers of *The Paper Industry* either bind complete copies of the issues into respective volumes or file tear copies of all articles appearing from month to month that are of particular interest to them. Such readers may not know just when the information contained in some one article might be of real help to them, but, if saved for permanent reference, it is available whenever desired.

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CURRENT THOUGHT

The Value of Research

WILLIAM SIBLEY

MANY years ago, up in Bismarck, North Dakota, I heard Mr. McKinstry, then vice-president of the International Harvester Company, say a very wise thing. Four of us were eating lunch in a hotel dining room, two of the party being farmers. One of the farmers said to Mr. McKinstry: "Why do you folks continue to spend so much money on advertising? Why everyone knows you folks. Surely, you don't have to advertise so much." Whereupon Mr. McKinstry said: "Regardless of who you are—just about the time you think that everyone knows who you are and what you make—you find a perfectly good prospect for your goods who never even heard of you."

That statement was made about advertising. But it was also made about research, because that, in effect, is what advertising is. Advertising is a form of constant research for prospects. And research, in all its varied forms, invariably pays big dividends. Too often the element of complacency so fills one's mind that a proper understanding or perspective of one's own business is made impossible. It pays to get the outsider's viewpoint. A case in point:

For a number of years I have been privileged to help in the promotion of a really remarkable industrial product. Preformed wire rope. The success with which this product now only about fourteen years old, has met, has been truly amazing. By dint of aggressive advertising, entirely in trade and class magazines, we have forced wide, universal acceptance and gained licensee arrangements from every other wire rope manufacturer in America. Counting in units of sale, preformed wire rope is today 1600 per cent over 1925. All in all we have every reason to be thoroughly satisfied with the progress made—even to the point of believing that we have finally "arrived."

But very recently we took a few hundred dollars and, through research people who didn't know a piece of wire rope from a niblick—men and women who were experienced in getting into offices and asking questions intelligently but who could in no way influence the response to questions—conducted a very profitable research. We asked the questions: "Do you use wire rope?" "What for?" "What brand do you use?" "Have you ever heard of preformed wire rope?" "What do you know about it—is it any better?" "Does it cost more or less than non-preformed wire rope?" etc., etc., etc. Our questionnaire merely sampled the thought of wire rope users—chosen at random from the classified telephone book. We made no mail survey, using publication lists to which we had been advertising. We went at random and sampled the thought of our (all wire rope manufacturers') prospects.

And the results have been amazing. Here we had been so complacent about our business. Sales had mounted in skyrocket fashion; profits had rolled in. Yet this survey reveals the fact that at least half of all the firms using wire rope—never even heard of "preformed"! And, of those who have heard of it, or even used it, many of their ideas of why it is better or how much it costs are, to say the least, completely haywire.

Honestly made surveys, conducted by people who don't know your business and don't want to beyond earning a few dollars for doing a good job of research, can be of great benefit. Invariably they will reveal to you things you didn't know—things you have suspected but put out of your mind because you didn't like the idea—things you should know for the benefit of your production or administration.

Now is there an end to the manner in which research may profitably be applied? The production and development of new products; the correction of credit losses; the recapture of lost customers; the improvement of present products; the reduction of labor turnover; the increase of sales—all are within the bourne of research, properly made.

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"By the way, William Sibley, why not hold the mirror of research up to your own face? Who knows—maybe there are a couple of unsuspected moles on your proboscis. You've been writing editorials for *The Paper Industry* regularly, and without interruption, since January, 1924. Does anyone ever read 'em any more—aside from Mr. Weston, the editor, and the compositor? Maybe a little survey would do *you* a wee bit of good."

"Okay, Bill. . . . That's a good idea. We'll questionnaire the readers—right now."

Mr. Paper Industry Reader:

Will you please be so kind as to answer the following questions? Your answers should be nothing if not frank. Indeed, the more frank and honest your answers the greater will be the appreciation of your co-operation. I thank you in advance.

1—Do you read "Current Thought" regularly?

2—In about what percentage of the time does the editorial please you?

3—Name one editorial, published recently, that made you mad.

4—What subject would you like to have me write on next month?

5—Would you suggest these editorials be two pages in length?

ADVERTISING PAGES REMOVED

THE PAPER INDUSTRY

A MONTHLY EDUCATIONAL JOURNAL

Freeness Tester In Manufacture of Boxboard and Test Liners

FREDERIC G. BARBER, Assistant Technical Superintendent
Container Corporation of America

This paper is a discussion of the application of the freeness tester in the manufacture of test liners and boxboards, insofar as I have been able to observe its uses, advantages, etc., in the plant with which I am associated and several other plants where the tester is being relied on as a means of controlling stock preparation.—Author's Note.

IT IS hardly necessary to point out that a freeness test is dependent both on fiber length and degree of hydration or fibrillation of these fibers. However, it does measure the rate of drainage which gives a very good indication of the workability of the stock in the vats and on the cylinders. Furthermore, it is logical to assume that when one uses similar stock and processes it by means of tackle which, for all practical purposes, changes only slightly over a long period of time, similar freeness readings will indicate stock that will work much the same on the paper machine and produce boards of some degree of uniformity. This then assumes a practical application of the freeness tester as can be used in production and, consequently, overlooks a few of the finer, more theoretical aspects that have been brought out in the literature for or against freeness testing as a method of stock control.

Another point in its favor, from a practical view point, is that beater men, machine tenders, and tour bosses feel that they can depend on the freeness tester as a good indication of the condition of the stock. It is the author's opinion that when a tester used in a paper mill receives that amount of faith from the operators, it has passed what might be termed the "acid test."

There are times when conditions arise that may make the freeness tester appear to be in error but with more and more experience, treating it as a precision instrument that has to be watched carefully, such misleading results are gradually being overcome. Some of these misleading results will be more fully covered later in this discussion, and criticisms, comments, or additions from readers who have had similar occurrences are invited.

Methods of Freeness Control

Freeness testing is carried on in the author's plant as a regular routine by specially trained men whose entire job consists of making freeness tests at regular intervals on various stocks prepared throughout the plant. Since these men are not directly responsible for the operation of the beaters and jordans, it is very important that they made all tests empirically and with no personal variations from test to test, or between operators. This is accomplished by establishing a definite routine that is rigidly adhered to, and such is extremely essential if any importance or value is to be laid on the freeness results obtained.

Other mills find it convenient and very satisfactory to have the jordan men make their own freeness tests. Such an arrangement works very well. The men soon learn to trust the tester as a better means of evaluating stock preparation and workability on the machine than the old method of feeling the stock. Using this method, tests are made at any time the jordan man feels that his stock may have changed either from his observations or those of the machine tender. In this way he has a very clear picture of exactly what a freeness test means in terms of the action of that stock on the paper machine.

To further insure constant accuracy, the freeness tester is thoroughly cleaned each day, and is calibrated at least once a week and any adjustments made that may be necessary. Although these steps may seem to be minor details, they are, nevertheless, very important if any degree of accuracy is to be expected from the freeness tester as a control instrument. Small accumulations of slime at the orifice, fibers on the screen, etc., soon change the readings on stocks that have identical properties on the paper machine. If the tester is allowed to get in such condition, the operators soon lose faith in the test and a lot of valuable ground is lost. They revert to the old rule of thumb methods with a different type of stock being prepared by each shift, and, consequently, a board with different characteristics resulting instead of a uniform product that the customer demands.

Freeness figures were formerly tabulated and posted where the beater men could see them. But in an attempt to aid in the interpretation of results obtained, freeness readings are now plotted graphically against time (see accompanying illustration of form used). This makes it quite easy for the operators to follow the trend of the stock that they are producing and gives a much clearer picture than does tabulated data. For instance, it formerly was impossible to maintain a uniform freeness for any length of time, whereas, in using the charted freeness data, stocks have been prepared at a freeness that did not vary over 2 cc. (Canadian-Green) for twelve to eighteen hours.

Freeness Standards

After a careful study of each machine and its inherent characteristics, optimum drainage rates or standards for each grade and weight of board have been established and are rigidly adhered to. However, machine conditions sometimes make it necessary to alter these standards from time to time as between winter and summer months, water temperature variations, etc.

DAILY BEATER ROOM LOG

MACHINE NO. _____ DATE _____ 193

TOUR BOSS _____ CHARTED BY _____
BEATER BOSS _____
ORDERS:

TOUR BOSS _____ CHARTED BY _____
BEATER BOSS _____
ORDERS:

TOUR BOSS _____ CHARTED BY _____
BEATER BOSS _____
ORDERS:

FREENESS - CANADIAN - GREEN - CORRECTED FOR TEMP. & CONSISTENCY

STANDARD-DASHED LINER-RED FILLER-BLUE X-TESTS AFTER JORDAN O-TESTS AT STUFF CHEST

CONSISTENCY

LINER-RED FILLER-BLUE BALE PULPER-GREEN SETTLING SYSTEM-BLACK

The standard line for a particular grade and weight is drawn on the chart as a dashed line and serves as a guide line for the operators.

Comments and Observations

It is possible to have long and/or short fibers which have a slow rate of drainage, that is "slow stock." Also it is possible to have long and/or short fibers which have a rapid rate of drainage, or "free stock." In other words, a fast drainage rate

does not necessarily indicate high latent strength. Due to these fundamental characteristics, tests on some stocks, for instance one which contains a large percentage of corrugated, may be misleading. Kraft pulp and straw pulp have a relatively fast drainage rate, and if these pulps were judged solely on freeness, both might be rated as having high latent strength. This difficulty is most often encountered in a test liner mill in attempting to evaluate test liner filler stock since it generally contains large amounts of corrugated waste in which the ratio between kraft and straw fibers varys markedly.

Attempts have been made to correlate, or use in conjunction with freeness tests, the results of the stock or fiber classifier but interpretation of results has been found difficult. Further investigations may eventually link freeness and classifications in such a way as to indicate what part of the drainage rate is due to fiber length and what part is due to fiberage.

In cases where kraft waste is used in the top liner stock, the freeness test on the unprocessed stock is a valuable guide to the ability of this stock to produce a good bender, high Mullen, etc. Care must be taken not to over-treat this stock in the Jordans since its latent strength has been quite well developed in the first processing. Such a freeness test gives some indication of the amount of beating and Jordaning necessary to bring the stock to the freeness standards.

In the case of such grades as chips, news, filled news, news vat lined chips, etc., the freeness test is considered to be an invaluable aid to uniform quality, increased production, and to the ability to reproduce a given set of characteristics on repeat orders. In a mill making a wide range of weights on one machine this becomes more evident since the freeness test enables the beater room to deliver the correctly treated stock at the proper time. Blows arising from stocks which are incompatible can be entirely eliminated.

Peeling caused from laminating plies with too widely differing drainage rates can also be avoided.

In folding box boards, poor bending properties can be eliminated by controlling liner freeness, as can smoothness to a marked degree while using a constant nip pressure.

There are, however, many misleading results that come about through freeness testing at times and should be guarded against or recognized at their occurence. For instance, should a freeness test, taken on stock at the discharge of the Jordans, show a certain freeness, it does not mean that all the stock in the chest is of that particular freeness. It may often happen that the machine tender may be having trouble with short or long stock while the freeness test shows a normal or standard reading at the time. Such fallacies can only be corrected by taking freeness tests at sufficiently frequent time intervals that a good indication of all the stock in the machine chest is obtained. This is another place where the charted freeness results are helpful for the trend gives an idea of the average stock in the chest.

The flow of stock through the Jordans varies these readings even though no changes have been made on Jordan settings. One way of overcoming this difficulty is to arrange constant leveling chests, both beater and machine, so that a practically uniform flow of stock is passing through the Jordans at all times. Such will necessitate less frequent testing of stock and will insure a more uniformily treated stock being supplied to the machine chest.

A further misleading factor that may cause alterations in the working of the stock on the cylinders even after preparing it at a standard freeness, is the amount of fines added in the white water. In order to insure an approximately constant amount of fines being added to the stock on its way to the vats, the white water should be agitated in such a manner that fines are not allowed to settle out. Such settling causes large amounts of fines to be added at times when the white water pit gets low causing a "standard freeness" stock at the Jordans to act like a slow stock on the machine.

Another variation that sometimes is perplexing to the operators results from the fact that freeness tests are all corrected to a standard consistency and temperature. Therefore, should freeness standards be set up during the winter months for a test liner, it will frequently happen that in the summer, as the stock and vat temperatures rise, it will be found that a much lower corrected freeness than standard gives a good working stock on the machine. Such a difficulty is most easily avoided by using a different set of standards as the seasons change.

Regardless of such problems—and one expects problems when instituting a precision measurement of such elusive properties as those of pulps—the freeness tester can be used successfully as a control instrument, at least until some testing instrument is devised for production work having fewer faults or short-comings.

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Resistance of Building Boards and Papers to Deterioration

With a part of a fund appropriated to the National Bureau of Standards for a general study of building materials relative to low-cost housing projects, the Paper Section is undertaking an investigation of the resistance of various types of fibrous building materials to deteriorative influences.

Insulating boards, boards used for outside and for interior finish, and sheathing papers, are all to be included in the study. The materials are to be subjected to accelerated aging by carrying them through cycles of change in temperature and humidity, with exposure to strong light such as that from a carbon arc. The effects of such influences will be found by measurements for distortion, expansion and contraction, and by testing for decrease in strength and moisture resistance, mold growth, and in other ways.

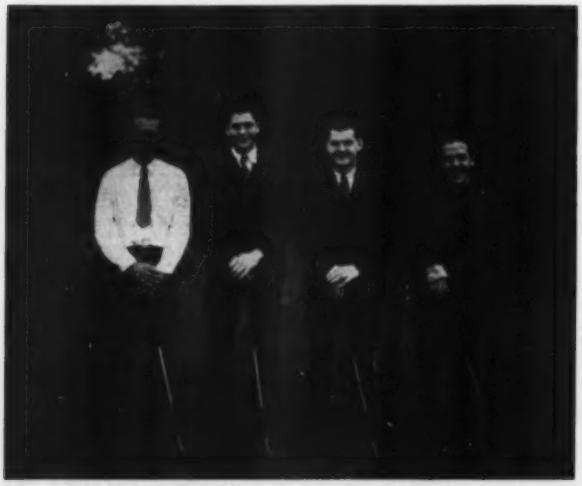
It is believed that this investigation will supply some information which is greatly needed to permit the house builder to make intelligent choice between the different types of these materials.

Recreation for Paper Mill Employees

GLENN STEWART
Kalamazoo Vegetable Parchment Company

EDGAR A. GUEST, that humble poet of the people, has said that "It takes a heap o' livin' in a house t' make it home." The employees of the Kalamazoo Vegetable Parchment Company have become firm believers in this bit of sagacious philosophy for they manage to get out of life the "heap o' livin' " necessary for real contentment. KVP's policy of a stable agreement between employer and employee has, in no small measure, contributed to the success of the company. Secure in their almost idyllic surroundings; Kindleberger Park, the Community House and the modern school; and yet free from social regimentation, the people of Parchment are living examples of what can be accomplished by and through the establishment of a model paper mill community.

Crowds at a semi-pro game in Kindleberger Park



1936 champions of the mill golf league

Social Activities

Two annual events which occur in the park Mr. and Mrs. Kindleberger have donated to the people, usually bring out crowds of from four to ten thousand spectators. While not strictly a KVP program, they are staged largely by KVP talent and are open to anyone who wants to come. The first of these is the Spring Festival, sponsored by the Kiwanis Club for the benefit of a local camp for underprivileged children. This show includes massed bands of the entire city, dancers, acrobats, singers and a wide variety of such entertainment. On the Fourth of July a mammoth patriotic pageant is enacted in Kindleberger Park which is sponsored by the United Veterans and which includes bands, drum and bugle corps contests, military drills, speeches, etc. This event winds up in a blaze of fireworks.

About every two years KVP puts on a big minstrel show that "packs 'em in" for three nights. This show has been a Parchment institution for years and is as much a musical show as it is a minstrel show. The big stage in the Community House offers exceptional facilities for such performances.

A fifty-piece band plays concerts during the summer in the park and during the winter in the Community House. Vaudeville skits are usually added and these

Kindleberger Park, showing the ball diamond, tennis and shuffleboard courts

Candid camera shots of the KVP Band at rehearsal

programs have become very popular. Nothing KVP does is apt to get out so many strictly mill people as these programs, for they are chiefly of the "popular" sort and are free to KVP employees and their families. A widely-known male quartette is always available for any occasion and many employees find interest in playing in the Sunday School orchestra or singing in the Christmas chorus. Many take part in the musical programs put on by the Union Church.

Any man in the mill or village is eligible to belong to the Parchment Men's Club. This organization has no dues, the only cost being a nominal charge for dinners that precede the meetings. Once a year a "Ladies' Night" is held with a program that is particularly interesting to the wives. The Men's Club is active throughout the winter and stages about seven programs which may include special speakers, motion pictures and various other types of entertainment. Each year the men put on a Ham Supper, serving from five to six hundred people, the proceeds of which go to their annual welfare work. The latter has been extremely important in the past five years and thanks to it, Parchment has never had an unemployment problem. The development of Kindleberger Park has been a great asset in the welfare program because it has provided work for dozens of men who otherwise would have been on relief.

Above and Below—The gardens in Kindleberger Park with rear view of the Community House

Parchment Minstrels at Community House

It has been a Parchment policy not to give out relief unless the recipients had a chance to earn it. In this way the men have kept their self-respect and at the same time the village has profited by their industry. Dozens of men who have shown their willingness to work thus have been put on mill payrolls when jobs opened up.

Sometimes KVP offers special courses in papermaking, public speaking and the like. Some of these courses are designed to acquaint employees with the uses to which the papers they make are put. First aid classes are also a part of employee activities and certificates are awarded to those who complete the training.

During the annual KVP Christmas party the entire mill shuts down to allow all employees to attend. This program is always of a religious nature with Christmas music and a speaker of national prominence. Presents are distributed to the employees. Following this program an Old Timer's Banquet is held to which all employees who have been with KVP ten years or longer are invited. Presents are given to all on this occasion.

The little weekly newspaper, *The Parchment News,* has about forty people connected with it in one capacity or another and a luncheon is tendered them on occasion as a reward for their faithfulness.

Home Works Plan

Mr. Kindleberger once said: "A boy that is trained to work early in life is getting one of the best parts of his education. The chances are that if he does not learn to work before he is 18, he will not be worth a great deal to industry." Using this philosophy as a basis, Mr. Kindleberger inaugurated a plan whereby the youth of the community is given an opportunity to engage in useful and part-time work during vacation months. Boys 15 to 18 belong to "The Home Works Corporation." They solicit and do odd jobs, wash cars, scrub porches, clean basements, mow yards, weed gardens, etc. Smaller boys, 12 to 14, belong to "The Junior Furniture Company." They make lawn furniture, hose reels, clothes props, shoe shine boxes, paint screens, and do many other handcraft jobs. The girls of the community belong to "The Junior Baking Company." They make and sell baked goods, help serve dinners at the Community House, sew, tend babies, and do many jobs of a similar nature. The groups of boys and girls elect officers and run everything in a business-like manner. The "company" is paid, not the boys and girls, who are paid from the "company's" treasury on the basis of work done. Thus, Parchment youth gets training in salesmanship, accounting, collections and other business practices as well as in work done with its hands.

Sports

Baseball, the sport of all Americans, is naturally the most important sport at KVP. Kalamazoo is a baseball town to a degree approaching rabid, and although it no longer supports a professional team as it did some years ago when Michigan cities had a Class B league, there is some pretty good ball played there.

KVP has a team in two leagues, the players of

Scenes at various Christmas parties in the Community House attended by all KVP employees

Left—1936 KVP ball team. Industrial champions of Kalamazoo and of the State of Michigan.
Right—1937 girls' softball team.

which are entirely on their own, receiving no compensation other than their regular wages at the mill. Sometimes the boys make a little when they play barnstorming major leaguers or semi-pro outfits but outside competition is not encouraged at present, there being plenty to be had right in town. Last year the Parchment team won the city league championship and then took part in the state meet. They won the state title and were only prevented from entering the national meet because of injuries.

For many years KVP teams have had close to a monopoly on Kalamazoo industrial league ball. This situation, however, has had its dangers, for in a small city there is much animosity on the part of the ball fans whose password becomes "Anything to beat them guys." This attitude naturally discourages the proper sportsmanship and feeling of good-will necessary to industrial play. What this amounts to, however, is that a good beating is good for any team now and then. KVP split up their state championship team last year for this reason and both teams are taking the lickings in the city league, so the baseball situation is a bit more healthy.

One of the best factors KVP has in their baseball activities is an ideal place to play. The diamond in Kindleberger Park is surrounded on three sides by hills and is kept in condition throughout the season. Major league ball players have said that there is not a better infield in either league.

In addition to the regular ball teams which have about forty men on their roster, KVP often has interdepartment teams, although they are not as active as they have been in the past due to the number of men that can be taken care of on the two league teams. The soft ball craze has not hit the Kalamazoo district as hard as it has elsewhere, but nearly every department in the mill has a team and there is a lot of keen rivalry. The girls have a soft ball team that plays similar teams from different mills. At all times the KVP management tries to put all teams on "their own" with as little "front office" supervision as possible. There is always a baseball banquet at the close of the season at which time prizes are awarded.

The Community House has a completely equipped gymnasium and in the winter, basket-ball takes first place in athletic activities. Sometimes there is a team entered in the city league, but most of the play is intramill. A half-dozen teams keep the court busy. The park also has tennis, horseshoe and shuffleboard courts which are well patronized. There are annual summer and fall tournaments in these sports. Six golf teams are entered in KVP's own league and a bowling league has been formed in the office.

The women of the office and mill have their own leagues. They either play, or have classes in, golf, tennis, hiking, swimming, archery, soft ball, horseback riding or basketball.

These social activities, welfare interests and sports, in addition to the mutual interest felt by KVP employees for one another, not only makes firm the ties that bind employer and employee but also strengthens the individual's quality of self-assurance. From any angle, KVP has found it good policy to support and take an interest in its own.

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Repair Parts Problem

W. F. Schaphorst, M.E.

FROM whom should a pulp and paper mill obtain repair parts for equipment?

Naturally, most of us say "from the equipment manufacturer," for such parts can be depended upon to fit properly and to wear as well as the original.

It is sometimes suggested that at the time of purchase of a machine one should lay in a sufficient supply of extras so as to be prepared in case of an emergency. An objection to this is that such a suggestion might have a tendency to shake the faith of the purchaser in the durability of the machine.

The owner of a machine is sometimes in immediate need of a simple repair part. It looks so very simple that he says to himself "I can make that myself in an hour and save five dollars," or some such thing. Right there is where a serious mistake is made. The chances are that the part won't fit properly. As a result, the machine gives less efficient service, its usefulness is impaired, and the reputation of the manufacturer may be injured.

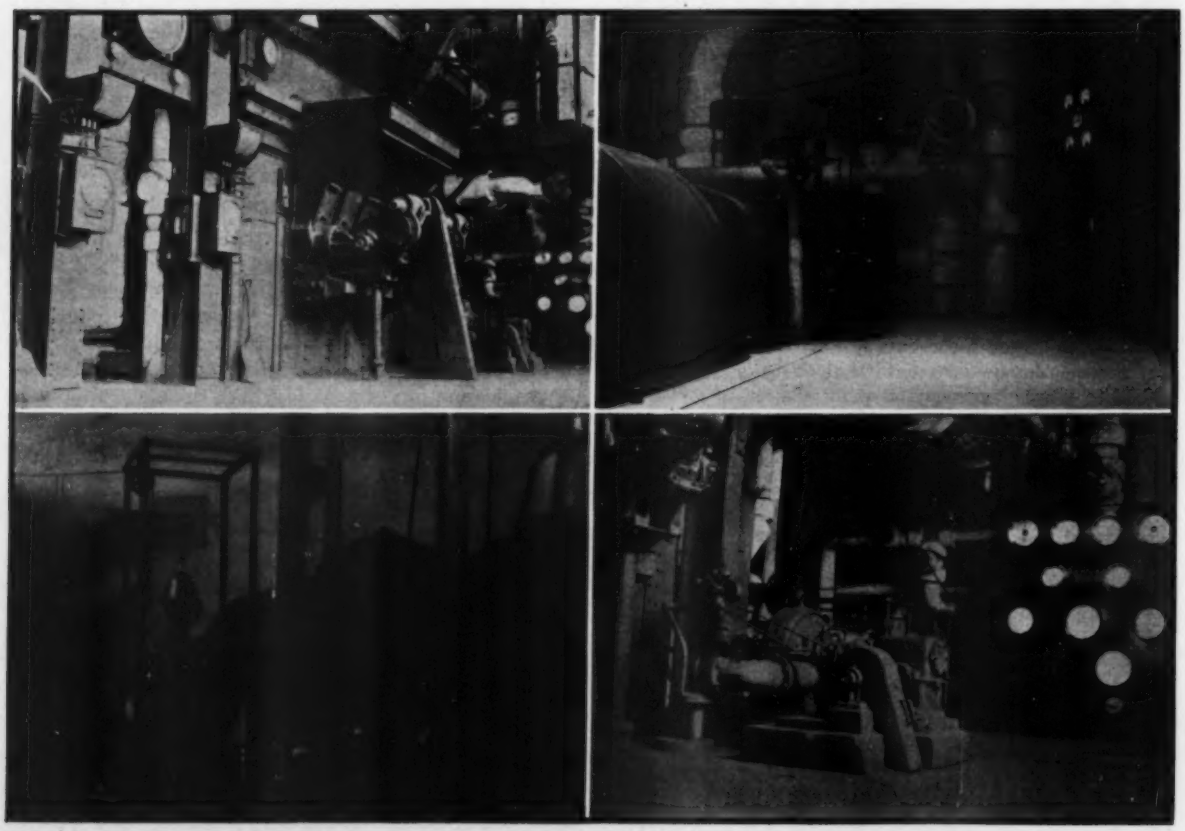
One example is a brass bushing, which appears to be very simple. However, the manufacture of finished bronze bearings and bushings is a job for the specialized manufacturer. Years of experience and much skill are required to make them right.

Supplementing Steam-Electric With Hydro-Electric Power

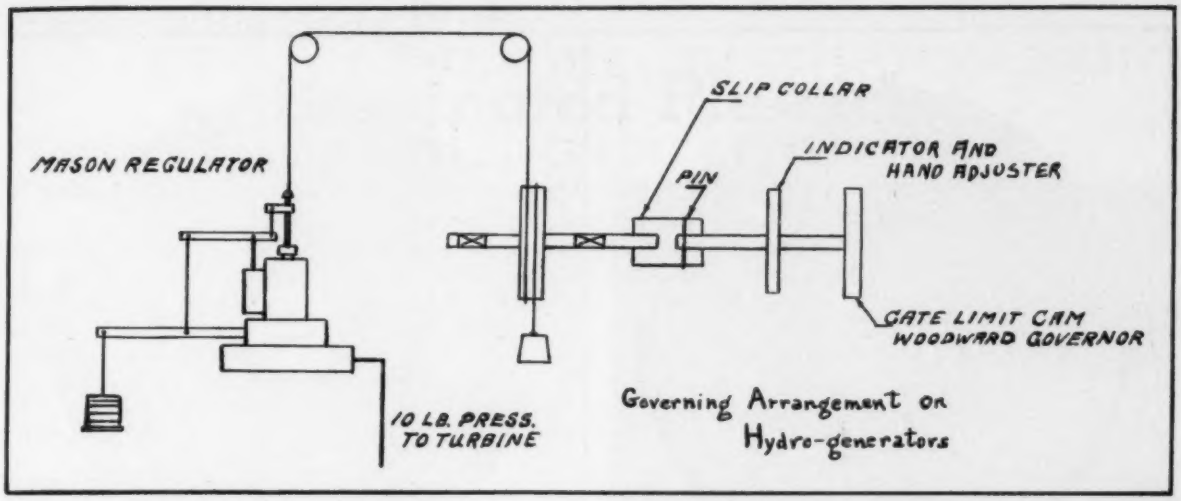
L. B. ROGERS, Chief Engineer Champion-International Company
As told to Francis A. Westbrook

THE Champion-International Company, paper manufacturer of Lawrence, Mass., has its own power plant in which both steam and water are used for the prime movers, the steam-electric generating equipment being operated primarily on the basis of providing low pressure steam on the exhaust side of the turbine in the amount to take care of process requirements, the balance of the electrical load being carried by the water wheels. The point is that a certain quantity of steam must be generated for process work, but, as water power is available, it is not economical to burn any more coal than is needed for this amount of steam. Consequently a method has been devised of operating the steam and water driven turbines in parallel and providing automatic regulation whereby the water driven generators take care of the excess of electrical load over that carried by the steam turbine driven generators.

The steam plant is a very modern installation designed to generate steam with a high degree of efficiency. There are two 600 hp., Walsh-Weidener cross drum water tube boilers which operate at 400 lb. Each boiler has 5520 sq. ft. of heating surface. They are fired with Taylor underfeed stokers having motor and Moore turbine drives operating through Cleveland speed reducers. Each of these boilers also has a Foster-Wheeler waterback which has been very effective in eliminating clinkers on the back wall of the combustion chambers. Each boiler likewise is provided with Bailey recording steam flow, air flow and uptake temperature meters. Coal is unloaded from the cars by means of an electrically operated, Browning crane hoist, which also is used to dump coal into the hopper over the crusher, whence it is elevated by bucket elevator to the top of the building and distributed to two 70-ton overhead bunkers by screw conveyors. From the bunkers the coal is delivered to the stoker hoppers by an automatic



Left to Right: Above—Stoker-fired boilers. Turbine room (note switchboard at right and piping at back). Below—Hydro-generators, governor at left. Turbine stoker drive in boiler house (note instrument board at right).



Governing Arrangement on Hydro-generators

Stephens-Adamson weighlorry, which is equipped with a Richardson scale.

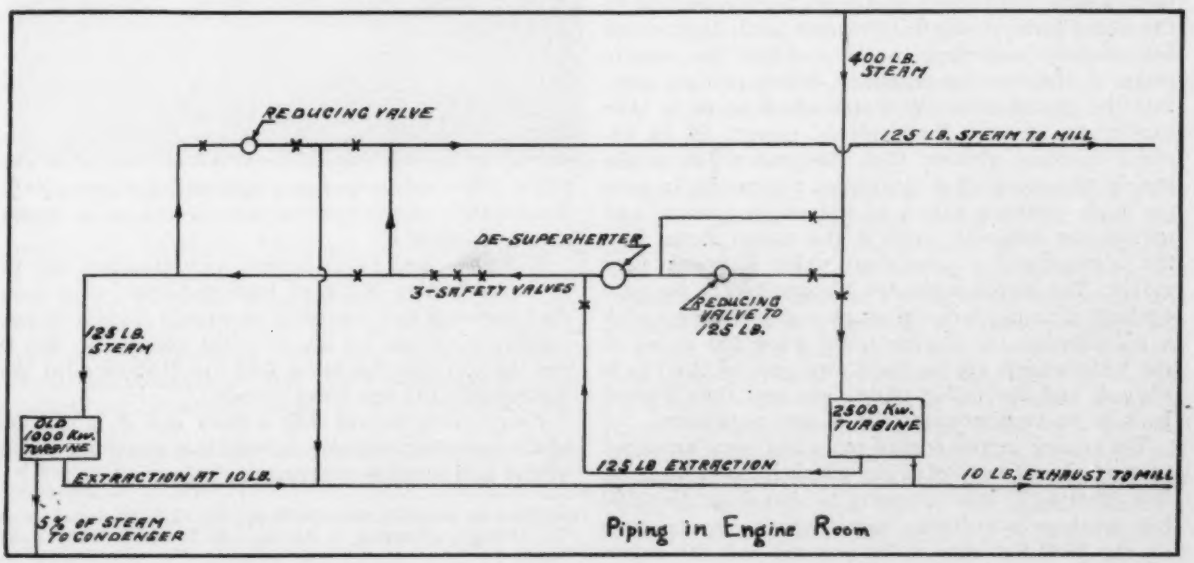
The feed water heater is of the Cochrane deaerating type. A Green economizer, installed some years before the present high pressure boilers were placed in service, was too good to junk. Consequently the water is pumped from the heater to the economizer at 150 lb. pressure and from the economizer to the boilers at about 425 lb. In order to make sure that these two pumps work together properly, they have been placed on the same shaft, and there are two units, one motor driven and the other G. E. turbine driven. The boiler feed pump turbine is 146 hp., 3600 r.p.m.

There are two induced draft fans and two forced draft fans, each driven by individual G. E. turbines. The induced draft fan turbines are 70 hp., 3692 r.p.m. and those for the forced draft fans 55 hp. 3555 r.p.m. The two power units also may be motor-driven.

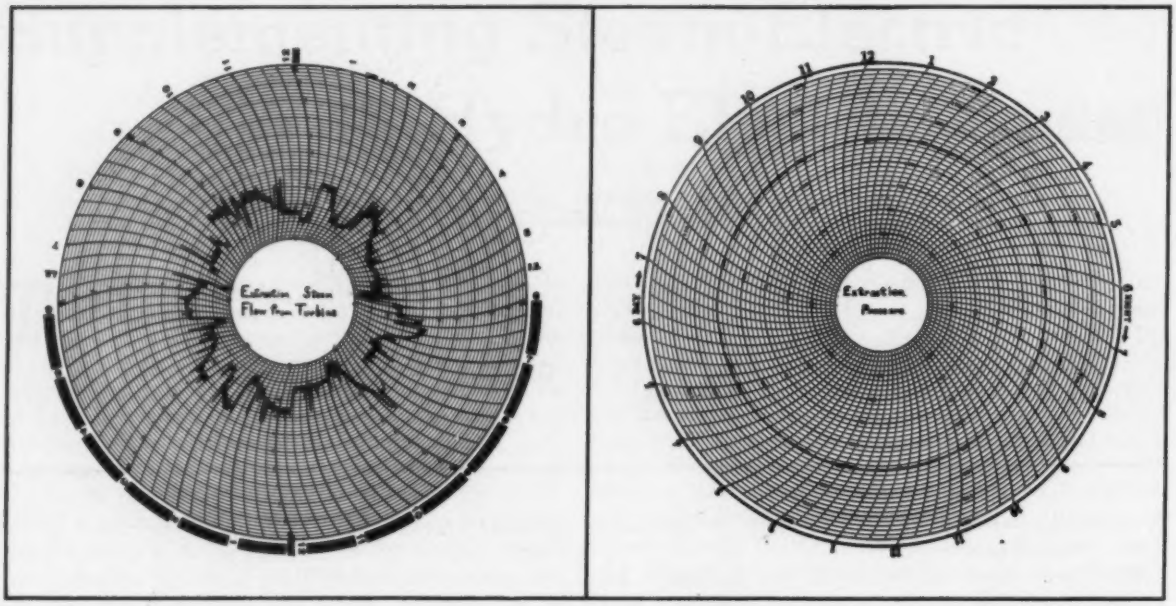
The turbo-generator is a 2500 kw., 3600 r.p.m., 10 stage 600-volt set. It takes steam at boiler pressure of approximately 400 lb. and operates at a back pressure averaging 10 lb. Steam is extracted at the fourth stage at 125 lb. for high pressure process work, the quantity extracted being governed automatically by the demand. All of the low pressure steam likewise is used for process work. About 85 per cent of all process steam is returned to the system in the form of condensate, so that comparatively little make-up is required. There is an old 1000-kw. unit now used only for stand-by which operates condensing at 125 lb. pressure and from which all but about 5 per cent of the steam is extracted at 10 lb. for process. The metering for these machines is very complete. It includes Bailey recording meters for the 125 lb. extracted steam from the large turbine and for the 400 lb. steam going into the turbine.

Fluctuations in the amount of extracted steam are very large, but the total amount used is fairly steady. The demand on the boilers, therefore, usually does not vary unduly.

Foxboro instruments are used for recording low, or back, pressure; the extracting, or bleeder, pressure; and for the temperatures of the extracted steam



Piping in Engine Room



and of the turbine. Charts of these recorders show that the pressure of the extracted steam practically never varies. Such steam is used at times to run the old turbine if conditions call for it.

Whatever electrical power is needed in addition to the power generated by the steam driven unit is supplied by two water driven generators. In this connection, it should be stated that there is no necessary relation between the amount of process steam being used and the amount of electrical power required at a given time. Thus it may well happen, and frequently does, that there may be a large demand for electrical power just when the amount of steam available for the turbine is small.

The two hydro-generators, one of 1000 kw. and the other of 500 kw. rating, and both of the Kingsbury thrust bearing type, are provided with Woodward governors. The latter have associated with them a Mason regulator on the high pressure side of the steam turbine. As this pressure tends to rise and fall slightly according to the demand for process steam it operates the regulator, which in turn actuates the governor on the water wheel so as to take care of the demand for electrical power. If the demand becomes greater than the water power can supply, the water wheel governors automatically open the high pressure valves to the steam turbine and permit the latter to exhaust the excess steam into the atmosphere, a condition which happens very rarely. The Mason regulator is connected to the gate opening limiting device through a slip coupling with a pin through it. During times when the speed of the waterwheels are on their own ground the pin is slipped, and the collar pulled out and then pushed back so as to disconnect the Mason regulator.

The piping in the engine room has been arranged to meet almost any condition which is likely to arise. For example, if it is necessary to shut down the 2500 kw. machine, a reducing valve permits the pressure on the 1000 kw. unit to be reduced and the superheat to be removed by a de-superheater; or, if there is trouble in the reducing valve, it can be by-passed and another reducing valve used. This second reducing valve also can be used to reduce 125 lb. steam to 10 lb. and in addition, 125 lb. steam for the old turbo-generator can be taken from the extraction point of the new 2500 kw. unit.

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Valves Control Pipe Lines[1]

Ninety per cent of the maintenance in a piping system should be in the valves. Valves control the line. They also guard it. They are the semaphores of the system and flash the red light when danger is ahead. Why condemn a valve because of a failure when that failure has informed you that your boiler is in danger, your superheater isn't working, or a feed water heater is being eaten alive by free oxygen? That valve is a saviour, not a devil.

In a large paper mill some of the boiler feed valves began to leak. They seemed to be binding and refused to close tightly. Four hundred pound steel valves they were—almost new. An engineer was permitted to open one of the valves. Out of it he took a handful of red muck. Other valves were examined with the same result. Examination of the material showed iron oxide—plain rust, and lots of it.

When the feed water heaters were examined one of the open heaters equipped with cast-iron baffles gave the impression that the baffles were made of black sponge rubber. Here was the source of the iron oxide. But it was the valves in the boiler feed line that revealed the destruction that was being wrought.

Every valve failure tells a story and it is the job of the operating engineer to read that story and put a proper and sensible interpretation upon it.

[1]From an article by Wm. H. Dopp, Jr., Sales Engineer, Crane Co., Chicago, appearing in January, 1937, issue of *The Valve World*.

Paper Mills Save With Laminated Plastics

F. PARKE MATTISON[1] and C. EUGENE CENTER[2]

LAMINATED resinous material of the plastics family has been constantly finding new applications. Actual experiences of the Rumford, Maine, mill of the Continental Paper and Bag Corporation (now owned and operated by Oxford Paper Company) with the more common applications of this versatile material in the form of doctor blades, gears, and bearings may be of value to other mills.

Thin Doctor Blades Best

Doctor blades have been used for about five years on wet rolls in place of wooden and metallic blades; none have been replaced as yet. Although some mills use beveled Micarta blades in thicknesses of 3/16 in. and ½ in. and widths up to 7 inches or 8 inches, this mill, after using some of this type, has learned that blades as thin as 3/32 in. and 2 inches or 3 inches wide are more satisfactory for its machines

Calender equipped with laminated non-metallic bearing

and grades of paper. They can be fitted to the roll more easily and their flexibility insures better cleaning action with less pressure applied.

A pressure of ½ lb. per inch of length is applied to these thin blades by means of a properly balanced floating-type blade holder. Counterweights are best applied by means of steel or iron strapping distributed along the back edge of the holder rather than weights hung on arms at the ends, since with the latter method springing of the holder diminishes the pressure at the center of the roll. Thin blades are left perfectly free to adjust themselves in the holder and to the roll. To prevent binding, the space between backing strips is made several thousandths wider than the blade thickness. One mounting hole through one end of the laminated strip and a slot at the other end allow for longitudinal expansion or contraction. On very long blades another slot in the middle may be desirable. These thin blades are not beveled.

Grinder bearing with shaft removed

Compared to wooden blades, laminated plastic does not warp as much or check and crack under alternate wet and dry conditions. Water and pulp suspensions in water are excellent lubricants so it wears less rapidly than wood. It requires less complicated adjusting mechanisms than do metal blades and does not groove the roll. Micarta doctors have been applied in this mill to breast, couch and wire rolls. Although none have as yet been used on calender and dryer rolls, they have been put on rubber top press rolls recently with good results.

Gears Wear Longer

Special Micarta gear stock is kept on hand in plate form of various thicknesses, and gears for many uses are cut in the mill's machine shop. Installed costs are on a par with cast iron or cut steel gears; although the material is a little more expensive, the ease of machining is greater. Used on pumps, winders, and various other machines, it is found that the life exceeds that of untreated steel, bronze, or cast iron gears where shock loads or vibration result in tooth breakage of these types. Lack of noise and reduced lubrication expense are also important advantages. The low coefficient of friction when mating with a metallic gear makes for high efficiency. Shrouds or end plates are not required as the method

(1) Formerly Mechanical Superintendent, Continental Paper & Bag Corp., Rumford, Me.; now connected with the Oxford Paper Co.
(2) Industrial Division, Westinghouse Electric & Manufacturing Co., Portland, Me.

of manufacturing Micarta prevents the laminations from opening up under wet conditions.

Synthetic Bearings Outlast Metal

The use of laminated plastics for bearings in the paper mill is one of its most important applications and seems to be limited only by the ingenuity of the

Press rolls (top and bottom) equipped with laminated plastic bearings

mill man in locations where water can be used as a lubricant.

The material is available in two forms and several grades for various purposes. For the small bearings and light loads of table rolls, wire rolls, wire guides, save-alls, filters, etc., liners are cut from tubing. For the larger press roll, calender, beater, and grinder bearings, 180-inch segments molded to shape are purchased. Thrust blocks, where required, are cut from plate and doweled to the liner.

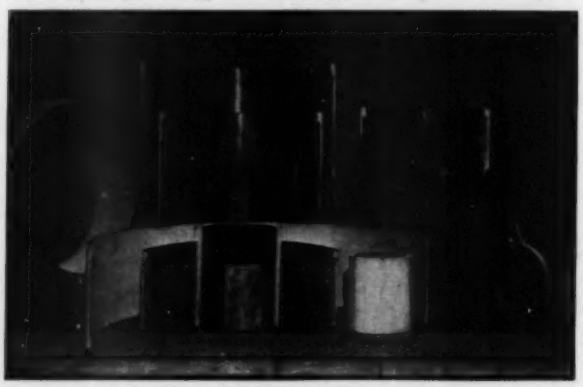
After considerable trouble with the frequent failure of the bronze bearings on the bottom roll of a second press section, bearings of this type were installed and the journals calipered. After six months of trouble-free service the roll was removed, journals calipered, and the bearings inspected. There was no noticeable wear and it was decided that this type was worth investigating further. First press top and bottom rolls of one machine were then outfitted with plastic bearings, with similar satisfactory results. Soon afterward, a 10 in. I.D. x 29 in. long bearing was put on a 54-inch six pocket grinder, and another was installed on the bottom calender roll of a 96-inch paper machine. Both of these were watched carefully at first but have given excellent results for over three years. Within the next year numerous table rolls, another grinder, and two more press sections were completely outfitted. In the last case this material replaced anti-friction bearings with success.

The "U" shaped bearings of a Nash wire guide on a machine running 900 f.p.m. were giving trouble. Replaced by a laminated bearing and receiving plenty of water by splash from the wire, these have shown no noticeable wear in over a year. One babbitted grinder bearing had failed, and the shaft was badly scored and pitted. Replace early in 1935 with a Micarta bearing an the shaft left untouched, recent examination showed that these rough spots had smoothed themselves out. Although irregularities were still present, the journal was remarkably smooth, and the bearing presented a perfectly even surface. Former styles of plain bearings have not as yet had to be reverted to in any installation in this mill. This, however, does not make plastics foolproof, as proper installation is of course very important.

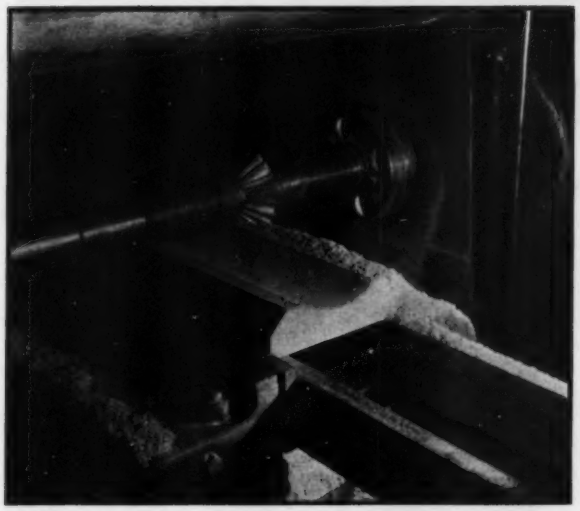
In general, clearances are slightly greater than customary with babbitt or bronze bearings in order to admit the water and to take care of the slight swelling due to moisture absorption (about 2.0 per cent by weight after 24 hour immersion). In this mill, clearances are 1/16 in. total on bearings 10 inches or over in diameter and 1/32 in. or 1/64 in. on smaller sizes, as compared to about 0.004 in.-0.006 in. with babbitt and 0.008-0.010 with bronze.

Plenty of water, acting both as lubricant and cooling medium, is flooded on the journal at the inrunning side on segmental bearings. The top edges are liberally chamfered to act as a reservoir. Grooving of either the tubular or segmental types is not necessary. For tubular bearings on small rolls the water is piped directly through a hole in the liner wall or else the liner is made in two cylindrical halves and the water introduced into the space about 1/8 in.-3/16 in. wide between. Lubricating water for table rolls may be had by splash from the wire. If this is not sufficient at the end toward the couch roll, a shower pipe is installed with holes over the bearings. On machines or sections where wet conditions prevail no special provisions are made for the drainage or overflow and the water runs freely out the ends.

When a plastic bearing replaces the larger water-



Typical bearings, gears and gear blanks used in the paper mill



Laminated plastic material is machined with ordinary metal working tools

cooled oil lubricated bearings, the water goes out the ends or through slots to the existing water-cooling chambers and piping with only minor changes necessary. On calenders and other machines where it is desirable to keep water away from the roll itself a grease seal is used at the roll neck. On press rolls, the mill has successfully used a felt ring backed by a steel ring put on the shaft against the bearing with a press fit. When extended shutdowns of the machine occur, a little grease or oil is applied to the journal to help in reducing starting friction. Ordinarily, however, the lubricating water supply is not shut off at all; this continual flow also prevents rusting of the shaft during shutdown.

Because of this practice, the mill employs no automatic controls on the water supply, although in some cases where it is preferable to shut off the water when the machine is idle it may be advisable to install a solenoid valve wired to the electrical drive so that adequate lubricant will not be dependent upon human memory. No special provisions are made for filtering the water as it is found that any grit or scale settling in spite of the continuous flow and constant motion will tend to embed itself in the Micarta and will not score the shaft.

In connection with calender bearings it was found that during the winter the 35 deg. or 40 deg. water cooled the ends of the rolls too much causing soft edges on the paper. By heating the water to 60 deg. or 70 deg. with steam this was easily remedied. Separate cooling chambers on large bearings are not used, as it is found that the properly adjusted flow of water to the bearing will keep the journal cooler than will the conventional type with oil.

Guide bearings for the vertical shafts of agitators are operating successfully running submerged in stock. Recently a thrust bearing for a vertical water wheel was made out of laminated plate and is standing up well.

There are many methods of securing the non-metallic liner in the box and each case can best be analyzed separately so that the changeover can be made as simply as possible. Tubular bearings are held by setscrews or may simply be pressed into the chuck with a tight fit. In some cases where wall thickness is large the liner may be keyed. For the segmental types, the type of mounting developed for steel mill service consisting of brass keeper strips bolted to the box and projecting over the longitudinal edge of the liner has worked out advantageously. This mill has also used a modification of this by welding small blocks of steel to the keeper and seating these into slots cut in the edge, or in some cases the outside cylindrical surface, of the liner. This prevents both longitudinal and rotational movement of the liner. In some locations where space does not allow for this type, the liner is held by deeply countersunk flathead screws from the inside of the bearing.

Although direct power measurements are hard to make on individual rolls of line-shaft drive paper machines, close approximations on the larger rolls and on such individual machines as grinders, etc., show that large journals equipped with laminated bearings require less power than do those with plain bearings. On the installation where roller bearings were replaced, power consumptions were about equal. Theoretically, such results would indicate that speeds and production could therefore be increased, but it is found that other factors in operating the machine limit the realization of such an advantage.

One of the principal savings is made in reduced maintenance and lubrication expense. On one set of 6⅜-inch I.D. bearings the rebabbitting cost, frequently incurred, was about $75, while non-metallic bearings were installed at a cost of approximately $20, thus representing a worthwhile investment. In the case of calender and grinder bearings it is found that the amount of lubricating water is less than the amount of cooling water previously used, and this difference plus the complete elimination of lubricating oil is thus clear operating profit. Longer life represents another item of saving.

Factors Affecting Paint Costs

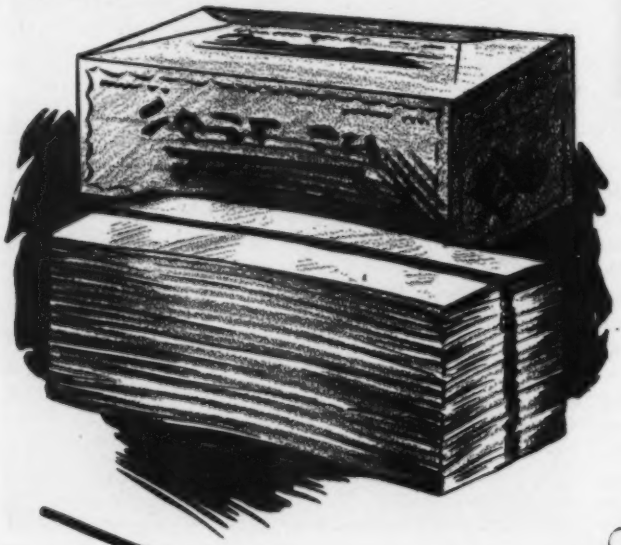
The major item in the cost of a painting job is, almost without exception, the labor cost of applying the paint. On some types of work, where there is considerable moving of staging involved, or where there is much careful cutting in to do, the labor cost may amount to 90 per cent of the total cost. On plain, flat, easily-reached surfaces, the labor percentage may be around 60 per cent.

Converting percentages to dollars, a typical $1,000 job might represent $750 worth of labor and $250 worth of materials.

On the face of it, this simple division of costs—75 per cent labor, 25 per cent materials—might appear to indicate that, if a saving of 40 per cent could be made in material costs, the saving on the job as a whole would be 10 per cent. This assumption would be true if there were no complicating factors. However, such things as hiding power, covering capacity and spreading ability must be considered.—From *Dutch Boy Quarterly.*

Paper Sketches---

23,000 STANDARD OIL COMPANY OF INDIANA DEALERS, IN A SINGLE YEAR, SUPPLIED MORE THAN 11,360 MILES OF PAPER TOWELS WHILE CATERING TO THE COMFORT AND CONVENIENCE OF MOTORISTS WHO USE THEIR REST ROOMS.



SO DEPENDENT WERE THE ANCIENT ROMANS UPON EGYPTIAN PAPYRUS THAT A CROP FAILURE DURING THE REIGN OF TIBERIUS CÆSAR ALMOST PRECIPITATED A RIOT.

SHEETS OF PAPER USED FOR MUSKET CARTRIDGES AND WADDING IN THE REVOLUTIONARY BATTLE WHICH RAGED ABOUT OLD TENANT CHURCH, PHILADELPHIA, CONTAINED COPIES OF A SERMON ON "DEFENSIVE WAR." THE SERMON HAD BEEN WRITTEN BY THE REV. GILBERT TENANT, PASTOR OF THE CHURCH.

PAPERMAKERS OF HOLLAND, DURING THE 17TH & 18TH CENTURIES, ARE SAID TO HAVE BEGUN WORK IN THE MILLS AT 3:30 A.M. AND TO HAVE QUIT AT ABOUT 10:00 A.M. THE REST OF THE DAY WAS GIVEN OVER TO TOIL IN THEIR FIELDS AND GARDENS.

Paper Coatings

OLIVER F. REDD, Chief Research Engineer
The Patterson Foundry & Machine Company

CALCIUM carbonate, produced as a by-product in paper mills using the sulphate process, is being used in increasing quantities for paper coatings. Considerable experimentation is being done to improve the quality of these coatings by laboratory investigation of the production technique and the development of machinery that will produce a uniform product without skilled supervision, and at the same time lower manufacturing costs.

One of the factors determining the quality of an image printed on a coated paper is the light scattering power of the coating used. This in turn is dependent on the refractive index and specific surface (area of exposed surface per unit weight of material) of the coating used. The refractive index of any coating is a physical characteristic of its composition and crystal structure. As calcium carbonate has a fairly high index of refraction, and is a by-product, it is relatively inexpensive. Therefore, the practical control of scattering power is limited to regulation of specific surface, or particle size.

The first step in the control of particle size is in the sulphate recovery process. Here the calcium carbonate is formed by chemical substitution. The carbonate is obtained as a crystalline precipitate, the crystal size of which is dependent on the rate of the chemical reaction, type and amount of agitation employed.

In the early stage of reaction, small crystals are formed, part of which may and do flocculate, or adhere, later to be bound into a single particle by further crystal growth. This flocculation may also occur at any subsequent stage of the precipitation or after the suspension has been prepared for use as a paper coating. Naturally the strength of the crystal bond will depend on how soon the flock is formed, the last formed flocks being more easily broken.

In view of the foregoing facts it would appear that particle size is best regulated by a control of agitation. However, it must be remembered that the main function of the reaction is the recovery of chemicals to be re-used in the sulphate paper process and that the calcium carbonate is a by-product. Therefore, agitation will be regulated by other factors than optimum particle size, making a second operation on the calcium carbonate necessary if a high quality coating is to be produced.

The highest quality coatings are prepared by "grinding" the calcium carbonate, the word grinding being used, in this instance, to describe the dispersion of finely ground material in a liquid vehicle. In the production of paper coating the so-called grinding is of short duration, with very little reduction in the size of perfectly formed crystals. However, the particles of coating which were first precipitated as two or more crystals, and later flocculated to be found by further crystal growth, have natural cleavage planes along which they may be readily fractured. Breaking the crystals along these planes results in the maximum increase of surface for the grinding energy expended.

As the problem of grinding paper coating is similar to that of grinding paint, it has been found that the pebble mill, in which such a large percentage of paint is ground, can readily be modified to form the ideal machine for grinding paper coating. This modification consists of a simple provision for continuous operation. These machines, because of their shape, are called tube mills.

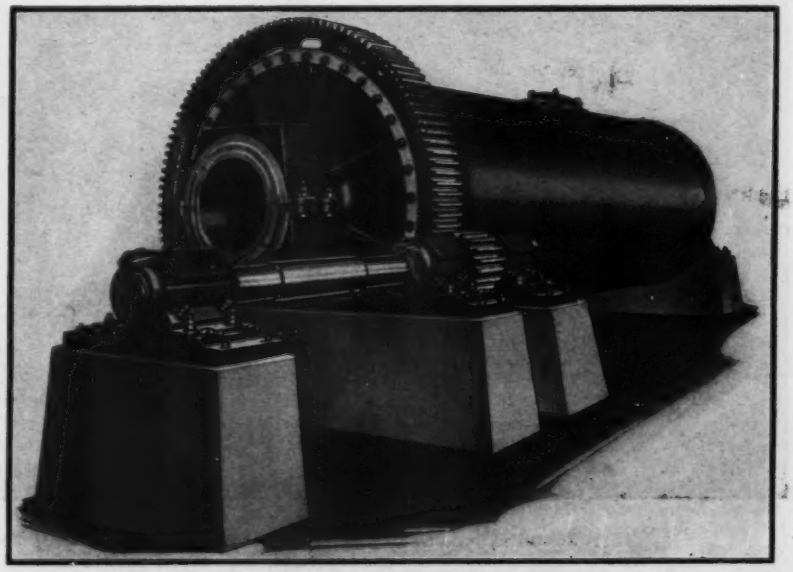
A tube mill, of course, is essentially a long, horizontal cylinder supported at each end by trunnions on which it rotates. For grinding paper coating, the mill is lined throughout with Silex, or white porcelain especially developed for its abrasion resisting properties. The cylinder is filled to a point just below the center line with either imported flint pebbles or smooth white porcelain balls.

The grinding is done by rotating the cylinder, feeding the paper coating into the cylinder through one trunnion and permitting it to flow out at the opposite trunnion. As the mill rotates, the pebbles or balls assume a new position in an effort to follow the rotation of the mill. The balls that are nearest the outside of the mill are forced to travel across the bottom of the charge, around the outside and up to a point near the top of the mill where, freed from further restraining pressure, they cataract, cascade and tumble to their former position at the bottom.

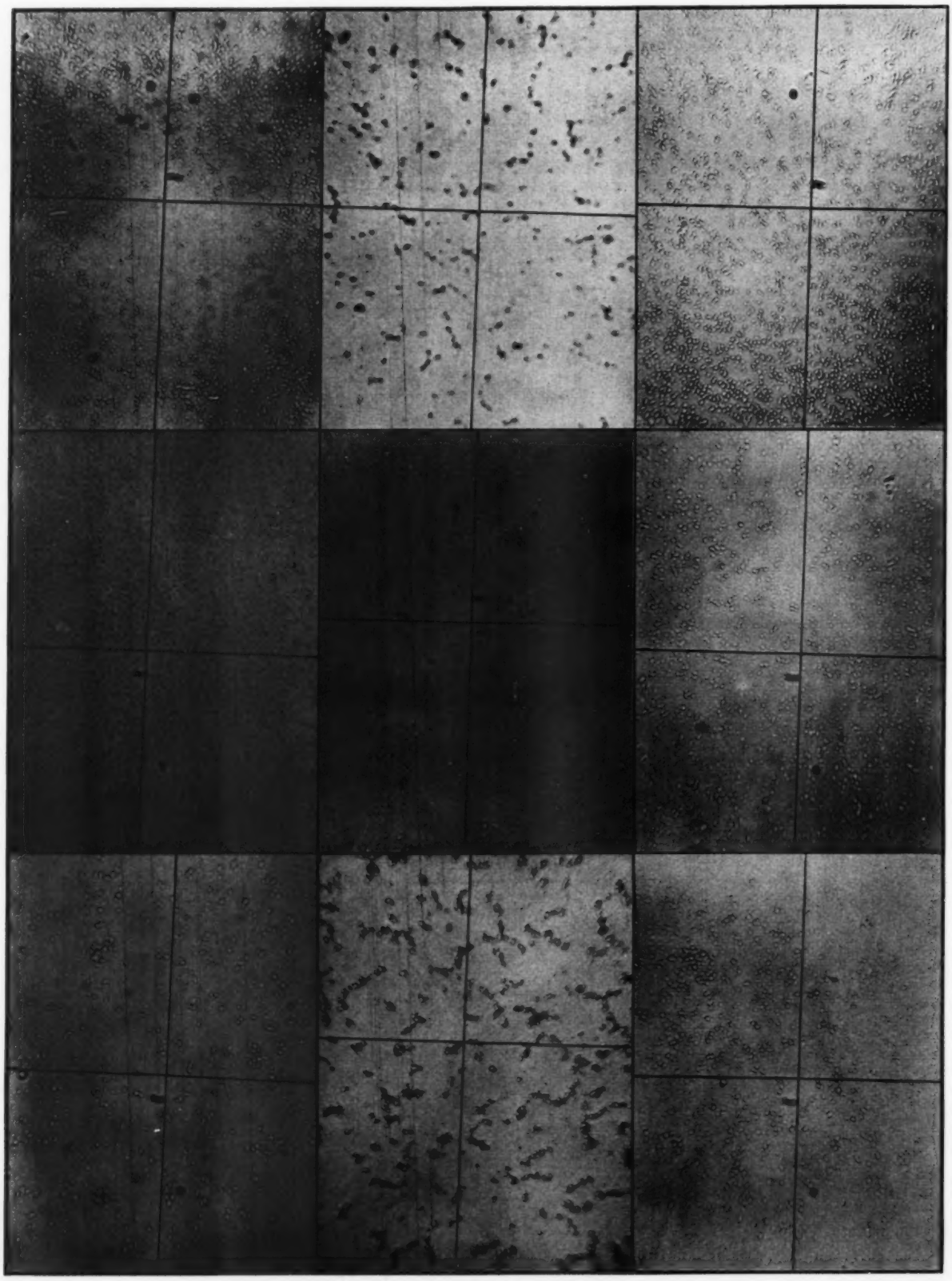
The paper coating which fills the interstices between the balls is ground by the tumbling of the balls. In a mill of average production size there are thousands of these balls, making it improbable if not impossible for any particle of coating to pass through the mill without being subject to the grinding action. As the balls are not restrained to any particular path, most of the grinding is done by fracturing the crystal along a cleavage plane developed during crystallization.

The extent to which the grinding is carried to produce new surface is easily controlled. Ratio of water and coating is regulated to produce negligible consumption of grinding media. The amount of pebbles or balls and the mill speed are selected from operating experience, leaving the rate of feed as the only variable. Regulation of feed rate is best accomplished by an automatic device, which can be adjusted to any predetermined feed rate and which will maintain the rate constant. The entire system will then maintain continuous uniform performance with no manual labor whatever.

Various chemical agents can be added to the calcium carbonate before grinding for the purpose of preventing reflocculation of the coating after grinding. These can best be added to the coating as it is fed to the mill. When so added, the mixer is entirely eliminated and the efficiency of the mill is greatly increased. These additions are either dispersing or wetting agents. Dispersing agents are to be preferred as they are more effective in preventing reflocculation, and do not lower the surface tension and cause troublesome foaming as many wetting agents do.



Tube mill for calcium carbonate grinding



Photomicrographs (500X) showing effect of grinding time. Sequence from left to right, from top to bottom

In order that the dispersing effect of additive agents may be shown, the theory of their use should be reviewed briefly.

In the atomic structure, certain electrical forces are assumed to exist which bind electrons to the nucleus. Often extra electrical force is obtained beyond the requirements of the individual atom. These residual forces are the valance bonds by which molecules are held. On most crystal surfaces there are residual electrical forces which, in an attempt to neutralize themselves, cause adjacent crystals to adhere. This adhesion of crystals is the cause of flocculation. More specifically, in the case of paper coatings, it is the cause of loss of specific surface and, consequently, scattering power.

If this generally accepted theory of agglomeration and flocculation is true, a dispersing agent should have the property of neutralizing any external surface force on each individual particle. In the case of water suspension of solids, the ideal dispersing agent would be one which would coat the surface of each particle, exactly neutralize the surface forces of each particle of solid and present to the water an electrically neutral and insoluble surface. Futhermore, it is desirable that this coating shall have a thickness of only one molecule, for these dispersing agents will adhere to themselves, if present in excess, and cause flocculation rather than prevent it.

The almost endless search for satisfactory agents, the best obtainable agents, their proper proportions and the methods of applying them may be easily understood. First, the optimum grinding consistency of the calcium carbonate must be determined. This varies with the size and speed of the mill, the density of the grinding media and other factors, and for proper control should be predetermined for each production size mill installed.

Years of experimental grinding of all sorts of substances and laboratory experiments provide formulae and experience for predicting the results that may be expected from production size mills, and with this as a basis all materials that might possibly prove to be dispersing agents are secured and tried. There are hundreds of possible agents and every agent has different characteristics. Because of this, each one must be used in different ratios and by different methods of application to secure the same results in the end. Furthermore, a number of experiments must be run on each of these materials to determine the proper quantities to add. For instance, the addition of a given quantity of one agent may provide optimum results, whereas a similar quantity of a different material may indicate failure, yet by correcting this quantity the second material may be found to have advantages.

There is also another variable caused by the amount of surface developed—or in other words, by the fineness desired in the finished product. Greater surface requires larger additions to cover the added surface.

All of these basic experiments are made in small laboratory jar mills of the batch type, with the operations carefully checked every fifteen minutes to determine what progress is being made. If at this interval no improvement is noted, further additions are made in measured quantities until failure is indicated or progress noted. Each of these samples is studied under a microscope, until no further improvement can be measured, after which photo-micrographs similar to specimens in the accompanying page illustration, magnified to 500 diameters, are made for record purposes. Those samples which show promise are then run through a pilot plant size Tube Mill until results from jar mill experiments have been duplicated, or, in rare cases, improved upon, and from this final experiment proper records are made.

The performance in the small tube mill indicates what may be expected from production size machines, and this conversion is made from formulae developed from theory and from constant rechecking of previous installations of production equipment calculated on a similar basis. In all cases, final recommendations for production size equipment are liberal enough to permit flexibility of operatio and variation in finished size or tonnage to accommodate varying demands.

A description of the experimental work and research behind the actual operation of the plant naturally lends an air of mystery and sensitiveness of balance to the process, but, as a matter of fact, after the proper values have been established, the control is very simple and unskilled labor can handle the job.

In conclusion, it appears that calcium carbonate may be used as a highly successful coating for finest papers, and that the process based upon the precipitation and tube milling method of production is at present the most successful and economical.

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◆ Pacific Coast Group to Build Mill at Fernandina

Fernandina, Florida, already the site of one large pulp and paper development, will be the scene of another similar project when ground is broken there for the erection of a 180 ton mill by the newly-formed Fernandina Pulp and Paper Company. The new company has been organized by Pacific Coast interests associated with the Rainier Pulp and Paper Company, Gray's Harbor Pulp and Paper Company and the Olympic Forest Products Company. The new Florida mill will cost approximately $6,000,000.

Selection of Fernandina as the site for the mill came after several months of negotiations with representatives of the pulp and paper company by City Manager O. H. Henderson and Mayor P. C. Kelly of Fernandina, aided by Warren T. White, general industrial agent of the Seaboard Air Line Railway. The mill will be served by the Seaboard Air Line road.

The new development is expected to add greatly to the commercial life of northeast Florida and southeast Georgia. Reasons given for the selection of Fernandina included: the abundance of pulpwood which is particularly adapted to the process involved, ample water for processing, favorable situation for waste disposal, adequate transportation by rail, water and highway, favorable labor market, tax exemption under Florida's laws, excellent climate and recreational facilities and a suitable site on the Amelia River.

It was stated that representatives of the pulp and paper company are now on the ground making plans to get work started at once. The plant will manufacture woodpulp from Southern pine and will give employment to about 400 men in the mill in addition to those who will be engaged in outside work. Several hundred men will be employed in the construction of the plant which will occupy a plot of some 175 acres.

◆ New Egyptian Paper Mill

Several years ago a company was formed in Egypt for the express purpose of establishing a paper plant to offset the large quantity of paper that was, and still is, being imported into that country. It was reported at the time that every preparation was made for the construction of the mill and that machinery had even been ordered from Germany for that purpose but the matter lay stagnant until recently when it was learned that the establishment of a paper mill in Egypt had become a certainty and that a company had been formed with a capital of L. E. 300,000 ($1,500,000).

The promoter of the scheme and president of the board is Egyptian Minister to Berlin, H. E. Hassan Nachaat Pasha. The board includes H. E. Ahmed Zulficar Pasha, vice-president; Theodore Cozzika, administrator and Zaki Mawass, Aly Emin Yehia Pasha, Gustave Aghion, Messrs. Pezas and Mohamed Abdel Moneil el Did Bey, members.

It has been reported that the construction work of the factory which will begin shortly, will be under the supervision of H. E. Mahmoud Sedky Pasha, ex-governor of Cairo. According to statistics compiled by the firm, 85 tons of paperboard and packing paper and 25 tons of press paper are consumed daily in Egypt.

◆ Safety Contest Closes

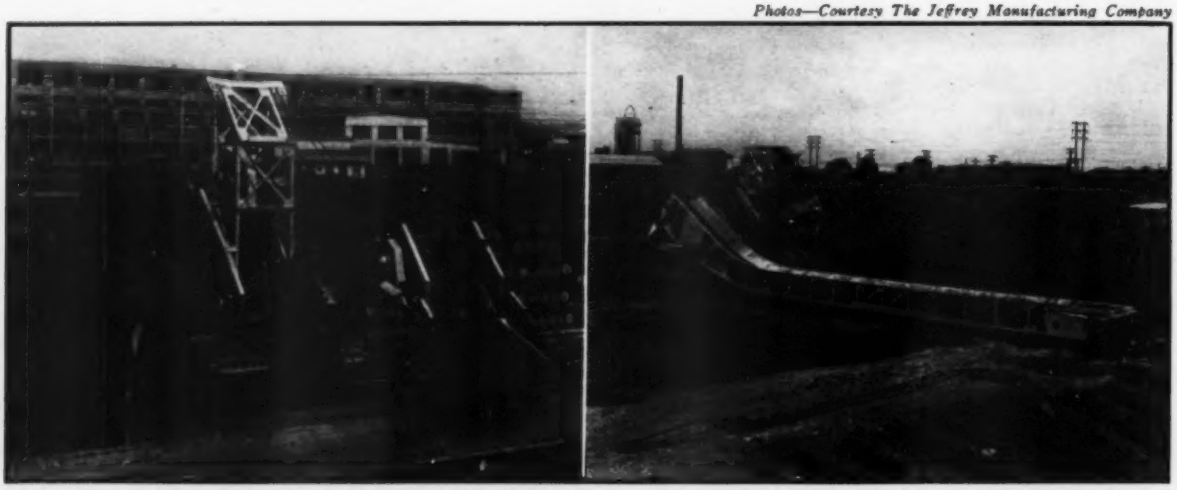
The final scores in THE PAPER INDUSTRY Annual Safety Contest are published in this issue. The contest closed June 30, 1937, and the report shows eight mills finishing the contest with perfect scores.

The National Safety Council wishes it understood, however, that these statistics are tentative. They must not be construed as announcing the group winners, nor should they be considered as final. All records will be carefully checked by the Council headquarters before a final report is published. Since the last reports were received there has not been sufficient time in which to audit the figures. Final report and announcement of winners in the contest will not be made until the 26th National Safety Congress in Kansas City, Mo., October 11 to 15, 1937.

General view of woodyard. One main wood handling conveyor in foreground, two barking drums and woodroom in left background, and chip bridge and digester house in center and right background

Wood Handling Conveyors at Champion's Texas Mill

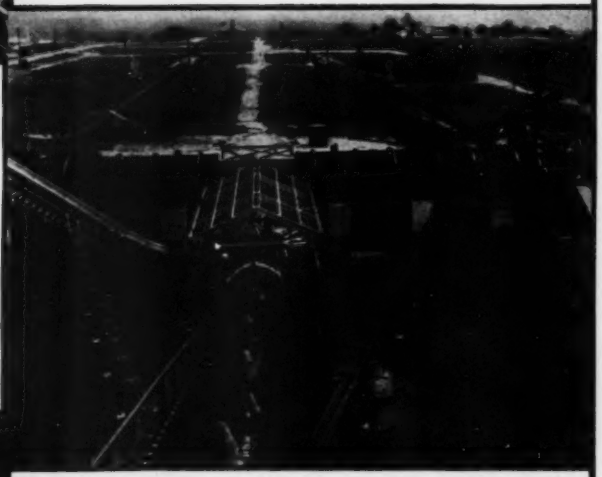
Photos—Courtesy The Jeffrey Manufacturing Company



Left—One of two wood handling transfer conveyors equipped with 15-ft. boom at discharge end that can be elevated to permit movement of railroad cars on railroad spurs. Right—One of two wood handling transfer conveyors without boom and located within area confined by two parallel railroad spurs

Left—Closeup of second main wood handling conveyor showing construction details. Note orderly piling of wood in storage

Right—Woodyard view showing positioning of the several conveyors in reference to barking drum installation. Note particularly the four transfer conveyors, the two main conveyors, and the conveyor in foreground for the handling of barked wood



Left—Chip screen installation showing belt conveyor for transferring oversize rejects to rechippers

Right—Main chip belt conveyor in bridge

Manometer Set-Ups for Liquid Level Indication

P. B. SHANNON, Development Engineer
The Meriam Company

WHEN used as a tank gauge, the basic principle of the manometer is that the pressure, due to the head of liquid in the tank, is transferred to the liquid in the well of the manometer, and this pressure is balanced by the rise of the gauge fluid in the manometer.

In some cases, it is advisable to have the manometer mounted at the bottom of the tank and the liquid pressure connected directly under the fluid in the manometer well. In other cases, it is advisable to mount the instrument at some distance from the tank, and, in this case, it is necessary to run a line from the well of the manometer, through the top of the tank, into the bottom of the tank. Air is then forced in this line from the manometer to the bottom of the tank, and as soon as the air pressure equals the pressure of the liquid head in the tank, the air will bubble out and cannot exceed the pressure of the liquid in the tank.

Inasmuch as the air pressure is the same in all parts of this line, this air pressure also acts upon the fluid in the manometer, causing the fluid to rise in the tube of the manometer until it just balances this air pressure. If both the liquid in the tank and the liquid in the manometer are of the same gravity, the instrument level will rise to the same height as that in the tank. If the specific gravity of the liquids differ, as is usually the case, the relative heights will be inversely as their specific gravities. Thus a mercury-filled manometer measuring water tank level will show a rise of only about 1/14 of the water height, mercury being approximately 13.6 times as heavy as water.

The manometer scale, of course, is calibrated accordingly, or, if the dimensions of the tank are known, it can be calibrated equally well to read in gallons or other convenient units.

To determine the length of manometer required, the following very simple formula is used:

$$h = \frac{H \times SpGT}{SpGM}$$

H = fluid depth in the tank in inches
h = scale length of the manometer in inches
SpGT = spec. gravity of the fluid in the tank with respect to water.
SpGM = spec. gravity of the meter fluid.

The accompanying illustrations show diagrammatically the installations of manometers on open and closed tanks.

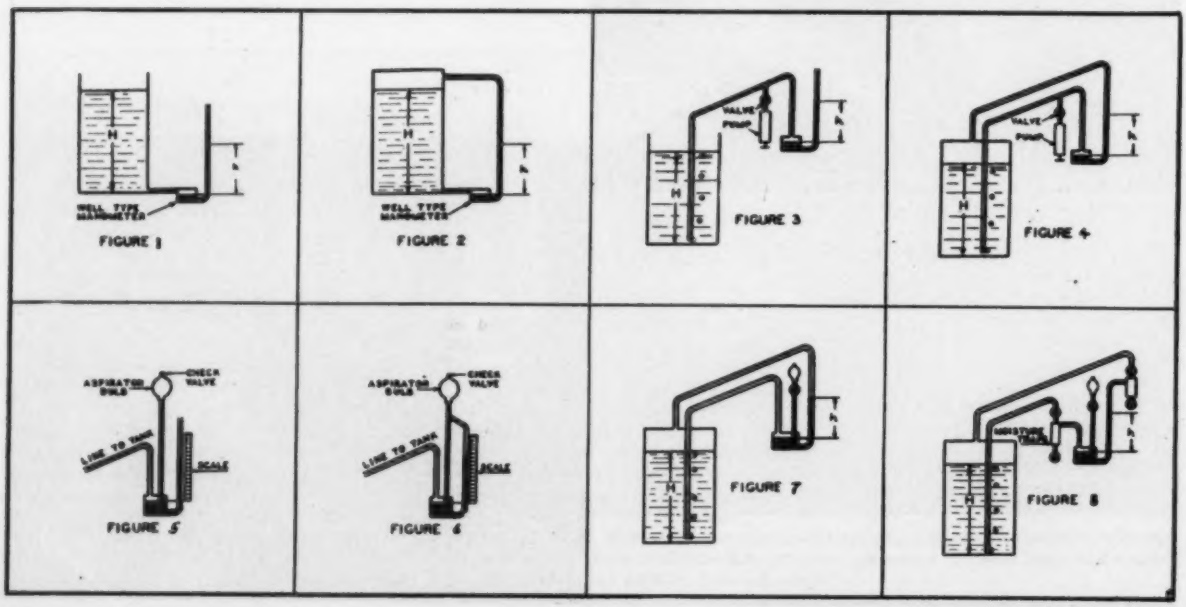
Figure 1 shows the installation of a manometer on an open tank where the fluid is directly on top of the fluid in the well of the manometer. Since the top of the tank and the top of the manometer are both open to atmospheric pressure, there is no need of any connection to the top of the tank. On this installation, the distance H and h vary inversely as the specific gravities of the fluid in the tank and the fluid in the manometer.

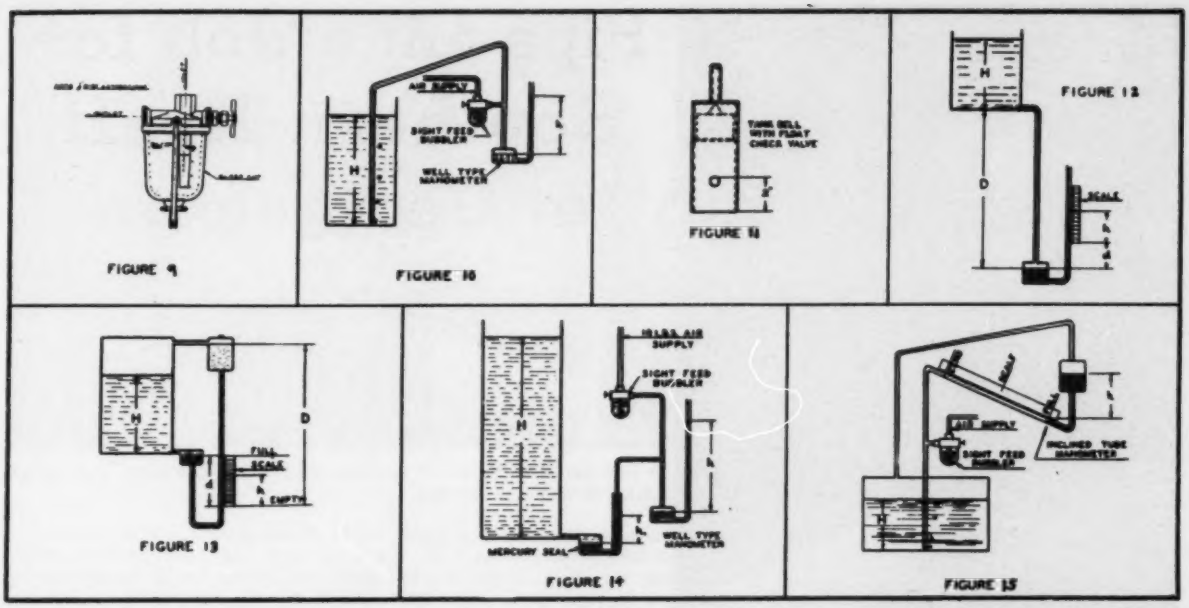
Figure 2 shows the same installation except that the tank is closed and pressure may exist on top of the fluid in the tank. In this case an equalizing line is necessary so that the same pressure is on top of the fluid in the gauge and the fluid in the manometer, which, therefore, rises and falls in exact accordance with the rise and fall of the fluid in the tank.

Figure 3 shows a manometer installation where the manometer can be located at any distance from the tank. In this installation, the line runs from the top of the tank to the bottom of the tank and over to the well of the manometer. As the fluid rises in the tank, it would also tend to rise in the line leading to the bottom of the tank. This compresses the air in this line and would cause the fluid to rise in the manometer.

To obtain correct readings, it is necessary to introduce air until the air bubbles out of the line at the bottom of the tank. This may be done by a hand pump as shown in the diagram. When the air is bubbling out of the line at the bottom of the tank, the air pressure is exactly equal to the fluid head above the point where the air bubbles out and this pressure acting on the fluid in the well of the manometer, causes it to rise in the manometer tube until it exactly balances this pressure. In this installation, the manometer may be either above or below the tank and any distance within reason from it.

Figure 5 shows the same installation except that the tank is under pressure and in this case an equalizing line must be run from the tank to the top of the manometer tube in a similar manner to that shown on Figure 2.





Figures 3 and 4 require the use of a valve, check valve and pump. To get away from this complication, air may be introduced into the line leading to the bottom of the tank through the liquid in the well of the manometer as shown diagrammatically in Figure 5. By the use of an aspirator bulb, air is forced through the liquid in the well of the manometer, and upon releasing the bulb the fluid rises in this line leading to the aspirator bulb and effectively prevents any loss of air pressure by this liquid seal. The liquid will rise in this line the same height as shown in the glass tube of the manometer and the scale is calibrated to take care of the drop in the well as the fluid rises in both of these tubes.

A bypass from just below the aspirator bulb to the top of the manometer tube is shown in Figure 6. The purpose of this bypass is to prevent the fluid being blown out of the gauge by introducing air too fast into the well of the manometer, before it is equalized in the line leading to the bottom of the tank; for in such a case it may build up sufficient pressure to do this. By using this equalizing line, the liquid is depressed in the glass tube of the manometer when the bulb is squeezed, and cannot be blown out.

Figure 7 shows this manometer with the aspirator bulb on the tank under pressure. This is for use on storage tanks such as used for gasoline or naphtha where the vapor pressure is only a few ounces. In operating the gauge it is necessary to squeeze the bulb, open the valve and force air through the liquid in the well of the manometer. Then the valve is closed and more air is introduced into the pump, and the operation repeated until the liquid stops rising in the tube of the manometer.

Figure 8 shows the same type of installation except that moisture traps are provided just ahead of the manometer. This is used where the liquid in the tank may be quite volatile and may condense at atmospheric temperatures. These moisture traps are for the purpose of keeping the condensed fluids out of the gauge itself.

Wherever the pressure on top of the fluid in the tank may be 5 lb. or 10 lb. pressure, a sight feed bubbler as shown in Figure 9 may be used.

Where the sight feed bubbler is used, it is necessary to run an air line, having approximately 15 lb. pressure, up to the bubbler. This arrangement is shown diagrammatically in Figure 10 for application where it is desired to bubble air continuously into the line leading to the bottom of the tank. In the event the tank is under pressure, it is necessary to have an equalizing line from the top of the manometer to the top of the tank.

Due to the fact that practically all tanks collect sediment and dirt in the bottom, it is inadvisable to measure the first 2 inches of fluid. A tank bell is usually fastened to the line leading to the bottom of the tank and this bell has openings, the top of which come 2" from the bottom of the bell. The air bubbles out through these openings and consequently the first 2" in the tank are not measured by the gauge but the scale reading starts at 2" and reads up.

Figure 11 shows such a tank bell with a float check valve. If the air pressure should fall in the line as the liquid would tend to rise in the tube, it lifts this check valve off its seat and closes off the line. This may be desirable on some installations.

In Figure 12 is shown an installation where the manometer is some distance below the bottom of the tank and the connection is made from the bottom of the tank to the well of the manometer. In this case it is necessary to correct for the additional head D by raising the zero point of the scale a distance on the manometer; otherwise the installation is the same as shown on Figure 1.

On some installations of tanks under pressure, it is desirable to mount the manometer at the bottom of the tank and to have the same fluid as that in the tank on top of the gauge fluid in the glass tube of the manometer.

Figure 13 shows such an installation, and here a seal pot is used at the top of the tank and a connection made from this seal pot to the top of the tube on the manometer. This seal pot is then filled with the same fluid as in the tank and condensation of the fluid in the tank tends to keep the seal pot filled at all times.

It will be noticed on this installation that the well of the manometer has been placed at the top and not at the bottom as shown in previous installations so that the zero on the scale is at the bottom. As the tank fills up and the level in the tank approaches the level of the seal pot, the fluid in the tube of the manometer rises toward the full mark on the scale.

Figure 14 shows a mercury seal between the fluid in the tank and the manometer gauge. This installation would be used on such material as naphthalene, which becomes solid at ordinary temperatures and must be heated in order to become liquid. The mercury seal balances the pressure of the fluid in the tank and by running a line from the well of the manometer through the mercury in one leg of the mercury seal, the gauge can be calibrated in terms of height H of the fluid in the tank.

Figure 15 shows an installation on a tank under pressure where a sight feed bubbler is used and one leg of the manometer is inclined at an angle to give a longer scale reading for the displacement height of the fluid in the manometer.

These diagrams cover practically every installation encountered in the use of the manometer as a liquid level indicator.

Pipe Line Job for Southern Kraft at Georgetown

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Portion of ten-mile pipe line through swamp

ONE of the largest industrial pipe line jobs of recent years has been completed for the new pulp and paper mill of the Southern Kraft Corporation at Georgetown, South Carolina.

More than 1400 tons of 24 in. ID Armco spiral butt-welded pipe, supplied in lengths of 49 ft. and manufactured by The American Rolling Mill Company, Middletown, Ohio, were used in 50,000 feet of pipe line. Designed to deliver eight million gallons of water a day, the line extends from the Black River to the mill in Georgetown.

The pipe has a spun lining and an outside coating of bitumastic enamel. Because of the lining, it is claimed that capacity of the pipe will be unchanged throughout its entire life, and that there will be no tuberculation.

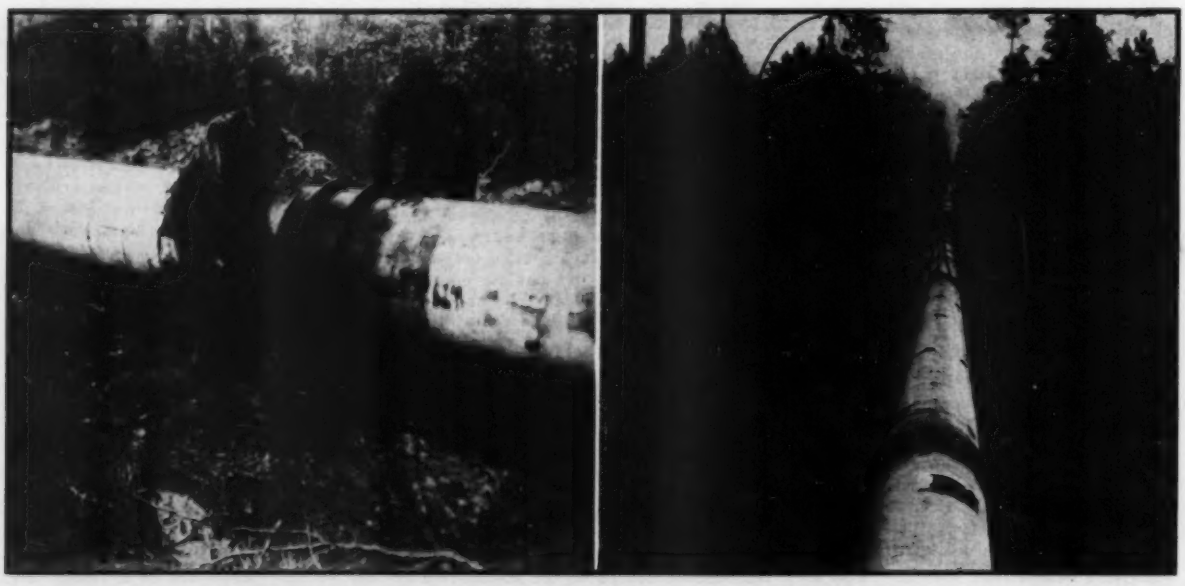
Exterior of the pipe was covered with 15-pound asbestos felt wrap, which was whitewashed to reflect the sun's heat while the pipe was enroute to Georgetown and during the work of its installation. All coatings were applied by the manufacturer before shipment was made.

"A" frames with small hand wrenches, a small drag line for digging, a small Caterpillar back-filler, 1000 feet of narrow gauge track for hand cars, a jib crane for unloading the pipe from the cars, and a few trucks comprised all of the equipment necessary for the job.

Part of the line is through heavy timbered country, another portion is through sandy loam and about three miles of the pipe courses through heavy cypress swamp.

For laying the pipe over the three miles of swamp land, it was necessary to set up 1000 feet of narrow-gauge railroad track, heavy enough to support a hand car with a section of pipe. After the trench was dug in the swamp land, the ends of each section of pipe were closed with wooden blocks. The sections then were lowered into the water and were pulled down the water-filled trench to the sections already in place.

The wooden blocks were removed at



Tightening bolts on dresser couplings. Right—Comparatively straight section of line

Left—Only ropes and "A" frames required to install 49-ft. sections of pipe. Right—Pipe ends blocked with wood to permit floating in water to next pipe section

the time couplings were installed. When water entered, the pipe sank to the ground level. This method was made possible only by the use of flexible couplings.

Dresser pipe couplings were used with quarter-inch middle rings, conventional Dresser gaskets and followers on the sides. Fourteen bolts, requiring only a small hand wrench for fastening, made the joints water-tight. In the first test at a pressure of 100 pounds per square inch, leaks were found only at the flanges on three of the valve installations.

The line is relatively uniform from the Black River to the plant, although the reservoir at the pulp and paper mill is about 20 feet higher than the pumping station at the source. Automatic air and vacuum valves are placed at the high points, and blowoff valves at the major low points.

The pipe was subjected to hydrostatic tests of 350 pounds per square inch at the mill.

Power at the river is furnished by two high-speed centrifugal pumps, driven by 150-horsepower Diesel engines.

As much as 2800 feet of pipe was laid in a day. No skilled labor was used. The laying crew was composed of a foreman and seven helpers; two men for tightening the couplings, and one for coating the couplings.

Contract for furnishing and laying pipe was made with the Dixie Culvert and Metal Company, of Atlanta, Ga. The Salmons Dredging Corporation, Charleston, S. C., was awarded the sub-contract.

◆ N. E. Supers to Meet in New Hampshire in Fall

The fall meeting of the Northeastern Division of the American Pulp and Paper Mill Superintendents, originally scheduled to be held at Poland Spring, Maine, will be held at the Waumbek Hotel, Jefferson, N. H., September 17 to 18, according to an announcement by George W. Craigie, field secretary.

Previously it had been announced that the meeting would take place from September 10 to 11, but due to the fact that another group was coming to Poland Spring at that time, arrangements were made to hold the meeting in New Hampshire at a later date.

◆ Plans Materialize for Chicago Power Show

Plans for the Chicago Exposition of Power and Mechanical Engineering, to be held at the New International Amphitheatre in Chicago from October 4 to 9, have been greatly advanced during recent weeks and the list of exhibitors at this time gives assurance that the show will be an outstanding one in terms of companies represented and comprehensive in terms of the products to be displayed.

Located in the midwest area, this show provides an ideal setting in which national manufacturers can demonstrate their equipment to the market represented by Chicago and the Great Lakes area.

Materials and equipment on display will include fuels, combustion units, steam generating and distribution systems, pipings and fittings, prime movers, pumps and hydraulic equipment, electric generators and motors, equipment to handle electrical transmission and distribution, control apparatus, instruments of precision, power driven machinery, machine tools, materials handling systems, heating, ventilating and refrigerating machines, air conditioning systems, lubricants, refractories and insulation.

In general, the spirit of the Chicago show will be an expression of the improved exposition technique which has become increasingly manifest during the past ten years. Dynamic and interesting displays, many of them in actual factory operation, will characterize the exposition as the story of the machine or material is told in terms of actual service.

◆ American Steam Pump Co. Now Has New Name

The American Steam Pump Company, Battle Creek, Mich., announces to the trade that its name has been changed to American-Marsh Pumps, Inc. This change involves no change in financial structure or management. The only reason for the new name is that the company felt the name American-Marsh (the name by which most of its equipment is known) was more appropriate.

When the company was first organized, a number of years ago, it manufactured steam pumps only. This made the former company name very fitting but now in addition to steam pumps this company builds centrifugal pumps, turbine pumps and power pumps for many services.

◆ Bureau of Standards Approves Reduction in Box Sizes

The Standing Committee in charge of Simplified Practice Recommendation R146-33, Corrugated and Solid Fibre Boxes for Canned Fruits and Vegetables, has approved a revision of the recommendation and the Division of Simplified Practice of the National Bureau of Standards has mailed copies to all interests for consideration and approval.

The original recommendation which was made effective January, 1933, established a list of 41 sizes of boxes based on the arrangement and number of cans per box, for the 27 cans which were standard at the time. The proposed revision reduces the 41 sizes to 26 and these are based on unit of pack and arrangement of cans in box, for the 21 sizes of cans currently standard in the canning industry.

Mimeographed copies of the proposed revision of the simplified practice recommendation may be had from the National Bureau of Standards.

◆ New Screen Plate Patented by Chromium Corporation

A new chromium plated screen plate for paper making machines, which has been introduced to the trade by the Chromium Corporation of America, has been patented recently by the latter firm. Ralph E. Cleveland, manager of the company's Waterbury, Conn., plant, was the inventor. The patent (No. 2,086,067) was issued July 6, 1937.

Current Survey of Paper and Paper Products

This article is part of a survey which appeared in Standard Trade and Securities issue of July 28, 1937, published by STANDARD STATISTICS CO., INC., New York, N. Y.—*Editor's Note.*

OPERATIONS of the paper industry in the third quarter to date, although reflecting the normal seasonal decline, have held well above those of the corresponding period of last year. Indications are, moreover, that activity will continue above the 1936 levels, despite the moderate uncertainties in a few divisions (principally paperboard) as a result of labor disturbances in consuming industries.

Labor relations in the industry itself have been harmonious, but some concern has arisen as to the fall and winter outlook for consumptinn of such items as paperboard in the event that any widespread outbreak of labor unrest should seriously curtail the shipment of goods and restriet purchasing power in certain communities. However, it is probable that this condition can be avoided, and all branches of the industry are expecting an active fall demand.

Manufacturing Costs Rise

Despite the absence of important labor disturbances, labor costs in the paper industry have increased materially. In fact, one leading paperboard and container manufacturer has reported an average increase of 21 per cent in wages as compared with those prevailing at this time last year. This condition, together with the higher prices for practically all raw materials, has materially advanced the costs of manufacture of all forms of paper. During the past twelve months, however, demand has reached a level which has permitted capacity operation with a mounting backlog of orders and has supported sharply higher selling prices for all grades other than newsprint. *In most instances, therefore, profit margins have been maintained, or even widened.*

Paper companies during the first six months of this year enjoyed one of the best half year periods of operations on record. With general business expected to be active, a continuation of the improved earnings is indicated for the second half of this year, with profits of most companies likely at least to duplicate those of the first half. A few companies will show substantially higher earnings because of additions to capacity.

Higher Newsprint Profits Indicated

Two divisions of the industry—newsprint and kraft—holds the center of interest at present. Sharply higher prices are indicated for newsprint, although it is not yet certain whether the $50 a ton scheduled by most Canadian producers for the first half of 1938 will become the established price. Great Northern Paper, the largest United States producer, has not yet announced its price for 1938. The higher prices will bring additional facilities into operation, but demand is expected to be at levels high enough to absorb all production.

Since the price should be at least $5 above the $42.50 quotation of 1937, and since production will be greater, materially higher profits are indicated for newsprint producers.

The expansion of sulphate pulp, kraft paper, and paperboard capacity in the South has caused some fear that capacity may become excessive.

At the present time, the chief question is whether or not demand for kraft products and board will expand sufficiently (principally in 1938) to absorb the added capacity. Considering that present capacity will be almost doubled by the end of 1938, it is difficult to see how the kraft and board division can go through all of next year without some degree of oversupply and consequent weakening of prices. Such a situation is likely even in the face of the fact that an increasing demand for Swedish kraft in Europe will probably lessen the supply available for the domestic market.

However, paperboard, kraft products, and container manufacturers generally would prefer to avoid runaway prices for their products, since moderate prices tend to widen usage and encourage the substitution of these materials for other commodities. Thus, considering the lower costs of the southern mills, reduced prices for kraft products and board could prevail without seriously impairing earning power, if reduced prices stimulate demand for products as expected. Finally, it is possible that there may be occasional delays in the completion of additional units, and all the capacity scheduled for next year may not be completed in 1938. *Earnings of kraft and paperboard companies, however, will probably be fairly well maintained.*

In the other divisions of the industry—such as book and specialty papers—maintenance of favorable prices and good demand is indicated, with consequent satisfactory profits.

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◆ WITH MANY VISITS TO RUBBER factories and paper mills on their itinerary, W. E. Green and R. M. Leighton of Stowe-Woodward Inc., sailed recently for England and the Continent on the S. S. Bremen. It is their intention to visit rubber firms with which their company has manufacturing agreements and to also visit many of the newer paper mills which have been built in Europe.

◆ Hawaiian Mill Makes Alpha Cellulose from Bagasse

A semi-commercial pulp and paper mill for the production of high grade alpha cellulose from bagasse, has recently been constructed in the Hawaiian Islands by the Maui Agricultural Company, Ltd., through their agents, Alexander and Baldwin, Ltd. of San Francisco. The construction of the mill was a result of several years of experimentation at the Maui organization's Paia mill on the island of Maui.

The complete pulp drying machine was furnished by the Pusey and Jones Corporation, vacuum washer and screens by the Improved Paper Machinery Corporation while the digesters and other equipment were designed and built in the Hawaiian Islands. The plant has been in operation for some time and plans are now being prepared for a complete commercial mill.

◆ THE IROQUOIS PAPER MILL, Thomson, N. Y., which has been closed since 1932, is expected to begin production not later than September 1. The company which will operate the mill is known as the Iroquois Paper Company of New York and was incorporated during May of this year. President of the new company is John Dix Coffin of New York and Thomas R. Remsen of Hudson Falls, N. Y., is vice-president and general manager in charge of the mill.

◆ AN ANNOUNCEMENT MADE recently by Ontario Minister of Lands and Forests, Peter Heenan, stated that the Ontario Government was "very close" to an agreement with interested capital for the construction of three new sulphite mills in Northern Ontario. According to Mr. Heenan the cost of the proposed new mills and of contemplated extensions to old ones will reach about $91,000,000.

◆ THE MILOS MILLS AT PENN YAN, N. Y., has been sold to the National Manufacturing Corporation of Tonawanda and will be used for the manufacture of roofing paper, according to a recent despatch. The mill was formerly a part of William H. Fox and Sons, Inc., Milos Mills being known as the John T. Andrews and Sons mills. The founding of these mills dates back to 1868.

◆ A VETERAN NEWSPAPER MAN and promotion editor of *The Cleveland Press* for the past two years, Paul Jones has been named director of the publicity division of the National Safety Council, Chicago. Mr. Jones joins the Council staff with an understanding of safety work gleaned from his many years of experience as a journalist and as a promoter of safety clubs.

◆ THE PULP MILL at Chandler, Que., closed for more than five years by the depression, was reopened recently by the Gaspesia Sulphite Company, Ltd., with a daily capacity of 150 tons of unbleached sulphite.

◆ New Dard Hunter Book

Mr. Dard Hunter, the well-known authority on hand-made papers, has recently completed a new volume entitled, "Chinese Ceremonial Paper," of which only one hundred and twenty-five copies have been issued. The number of copies in this edition has been determined by actual limitations and not through any desire to create a false rarity by unnecessary curtailment.

During several journeys to the Far East, Mr. Hunter was able to see many hand-made paper mills in operation and many of these observations have been recorded in book form. In some parts of China, Indo-China and Siam, where Chinese people live and retain their age-old rites and customs, Mr. Hunter was privileged to witness many religious ceremonies connected with paper. The present volume not only deals with the use of paper in Chinese sacrificial offerings but is also devoted to the making and decorating of the holy paper.

Illustrations in Mr. Hunter's book consist of nine photogravures, two collotypes and five prints in color made from old wood blocks procured in China. Aside from the comprehensive illustrative material there are fifty original specimens of ceremonial paper including the following:

Bamboo paper, the K'ang Hsi period (1662-1723).

Bamboo paper, the Ch'ien Lung period (1736-1796).

Modern bamboo paper for burning at funerals.

Ceremonial tin foil paper before printing.

Ceremonial paper stained gold with *Saphora japonica.*

Three papers in gold and silver, representing riches.

Three specimens of fire paper used in Siam and China.

Two examples of burning paper from Yên-Thai and Lang-Buloi, the "paper villages" of Indo-China.

Specimens of "sycee" from Kwangtung and Fukien.

Two mantras *(wang shêng ch'ien)* for burning before the ancestral portraits.

Two examples of the well-known *shou* paper in red and gold, printed from wood blocks.

Two sheets of white and yellow pierced coin paper for burning at the time of death.

An example of the common mock-money used by the lowly classes of China.

An elaborate ceremonial paper such as used by the Chinese population of Bangkok, Siam.

A printed sacrificial paper in use by the Chinese living in the Philippine Islands.

Two large specimens of paper *hua pao-fu* used for holding the ceremonial paper while burning.

Two mock-money burning trays made from the bamboo paper of Kwangtung Province, Southern China.

The obituary notice of a Chinese military officer, in red and black on yellow paper.

An ornamental burning envelope used by the Chinese population of Kedah, Malay States.

A wedding envelope in red, wood block printed.

Four large examples of the block printed *hsiang shên hsing san shou lu fu,* or planet gods paper.

Three specimens of the red and gold *Tao Tsu, Ts' ai Shên* and *Lu Shên* papers.

An example of mock-money used by the poor classes of Chinese living in Siam.

A sheet of the unique nine-hole spirit paper, made in Kwangtung from bamboo fibre.

Three specimens of the modern *hsiao chih ch'ien* as used in Northern China.

Two examples of the prosaic mock-money as used in Peking at the present time.

A specimen of the highly-ornate kitchen gods.

Two large examples of the ferocious gate gods.

An example of the small gate god and specimens of the block printed courtyard and room gods.

The text of "Chinese Ceremonial Paper" is printed on paper made by hand in the Orient from the inner bark of the mulberry tree *(Broussonetia papyrifera).* The photogravures and collotypes are imprinted on paper fabricated in Mr. Hunter's mill from linen and cotton. The book is permanently bound in stout boards with a leather back and parchment corners. The cover papers are printed from the original wood block that was used in making the wall decorations for the private apartments of the last Emperor of China. The binding is the work of Mr. Peter Fanck, Gaylordsville, Conn., who has bound the books from this press for twenty-two years.

The price of the work is $37.50 per copy.

◆ To Erect Sulphite Mill at Prince Rupert, B. C.

Arrangements have been completed for the erection of an $8,000,000 bleached sulphite mill at Prince Rupert, B. C., according to a recent announcement made by Frank L. Buckley, Vancouver business man, who has returned from a trip to New York and Eastern Canada. The mill should be completed by the end of 1938 and will have a daily capacity of 250 tons, according to Mr. Buckley.

◆ Important Changes at Kimberly-Clark

Announcement has just been made that Cola G. Parker is to be associated with Kimberly-Clark Corporation, Neenah, Wis., as assistant to the president, F. J. Sensenbrenner. Mr. Parker is a member of the New York firm of attorneys, Wise, Whitney & Parker, and is managing director of the Book Paper Manufacturers Association.

Another important change in the Kimberly-Clark organization is the resignation of W. Y. Ryan, purchasing agent and traffic manager, and C. A. Sommers, secretary-treasurer, both of whom are retiring. These gentlemen are succeeded by L. C. Stilp, who becomes purchasing agent; W. K. Austin, traffic manager; W. H. Clifford, treasurer; J. F. Hunt, secretary and controller.

J. Leslie Sensenbrenner, who has been manager of the Niagara Falls plants of Kimberly-Clark, will be associated with the sales department at the home office in Neenah. Fred W. Van Liew, formerly superintendent of personnel at Niagara Falls, will succeed Mr. Sensenbrenner. A. G. Briggs, formerly superintendent of personnel at the company's mill at Kimberly, Wis., will succeed Mr. Van Liew. L. S. Wolfe will succeed Mr. Briggs.

◆ Howell H. Howard

Injuries received while playing polo proved fatal to Howell H. Howard, treasurer of the Aetna Paper Company, Dayton, Ohio. Mr. Howard never regained consciousness after the accident and passed away at the Nassau Hospital the afternoon of July 9.

Mr. Howard was born in 1898, the son of the late Lillian Hoffman of Cincinnati and Colonel Maxwell Howard of Lebanon, Kentucky. He was graduated from Yale in 1919 and later attended Oxford University, where he made quite a reputation at polo and steeplechase riding. Mr. Howard held a five-goal rating, according to the United States Polo Association's handicap lists, and was a leading exponent of the game in the middle west.

For seven years Mr. Howard was very active in the paper industry. In addition to being treasurer of the Aetna Company, he was affiliated in an official capacity with the Howard Paper Company, Urbana, Ohio, the Maxwell Paper Company, Franklin, Ohio, and the Dayton Envelope Company of Dayton, Ohio.

Mr. Howard is survived by his wife, Loretta Howard, four children and a sister. Funeral services were held July 12 at his home in Jericho, Long Island.

◆ THE IDEAL COMMUTATOR DRESSER COMPANY of Sycamore, Ill., has bought out the Revolution Counter business of the Belden Manufacturing Company. Hereafter this products will be manufactured and marketed by the Ideal company at Sycamore.

◆ WILLIAM C. STETTINIUS, a director of the Worthington Pump and Machinery Corporation, passed away July 20 in Baltimore at the age of 41. He was the son of the late Edward R. Stettinius, former Assistant Secretary of War, whose widow still survives.

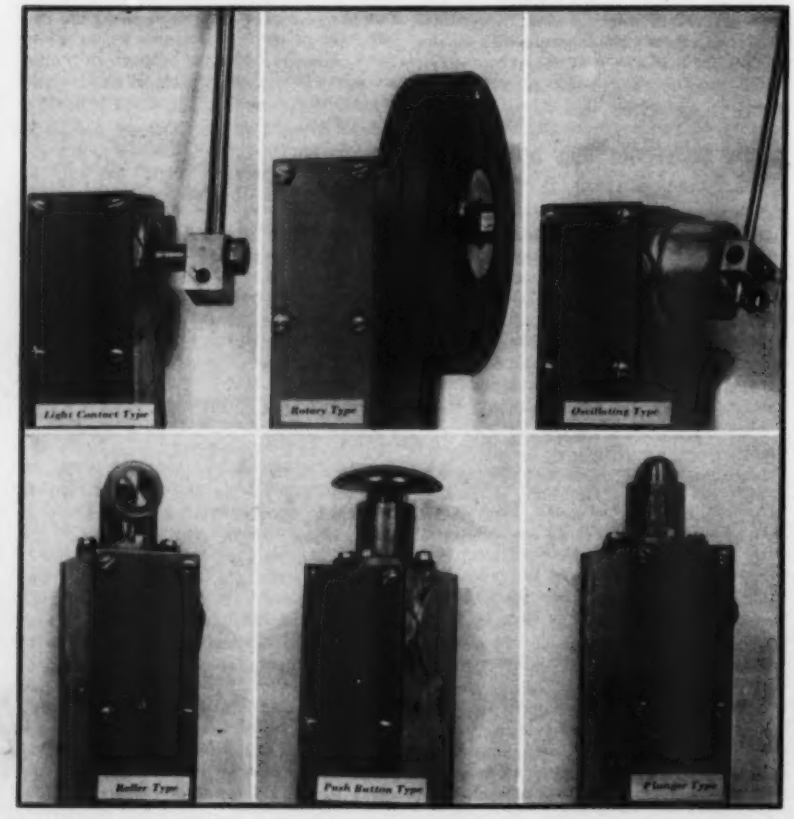
◆ THE RIEGEL PAPER CORPORATION of New York City intends to build a mill near Wilmington, N. C., which will produce approximately 125 tons of bleachable sulphate daily, according to J. L. Riegel of that company. The estimated cost of the plant has not been announced as yet but it has been stated that the Riegel company has already bought substantial timber acreage adjacent to the site of the new plant.

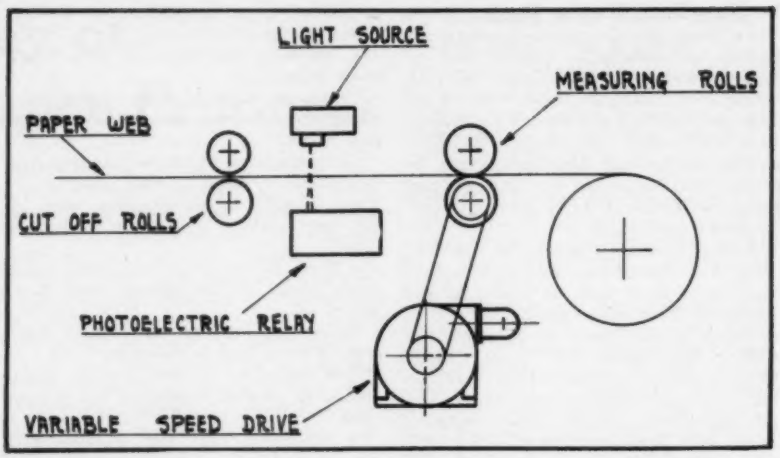
◆ Synthetic Elastic Coated Kraft

A 40-lb. kraft paper coated on one side with a thin coating of a synthetic elastic known as Koraseal has been announced by The B. F. Goodrich Company, Akron, Ohio under the name of Koroseal paper. It is stated that the coating will flex as long as the paper and will not crack; that it increases the tear resistance of the paper; that it is less inflammable than the paper; that it is not affected by sunlight; and that it will not oxidize. The coated paper has an overall thickness of .006 in. to .0065 in., weighs .308 pound per lineal yard, and is available in rolls 200 yards long and 40 in. wide. The manufacturer recommends it for packaging foodstuffs, chemicals, oils, etc.; and suggests that it can be used for making gaskets, shields and flower pots or as a covering for heat insulation to exclude moisture.

◆ Super-Sensitive Line Voltage Switch

A super-sensitive switch that is claimed to have unusually long life has been announced by The National Acme Co., 157 East 131 Street, Cleveland, Ohio. The switch is made in five different types—rotary, light contact, oscillating, plunger and push; and is designed for alternating current application. It is suggested by the manufacturer for use as a limit switch, or safety switch, or in connection with counting devices, circuit breakers, liquid level controls, gauge devices, relays, pressure controls and governors. *(See illustration below).*





◆ Anticipating Device for Pyrometer Controllers

The Bristol Company, Waterbury, Conn., has announced the development of a device known as the B-Linator, for use with automatic pyrometer controllers. The device can be used with practically all of the commonly used types of pyrometer controllers and can be added to present installations as well as incorporated in the control circuit of new equipment. Its use enables controllers to anticipate temperature changes and correct fuel consumption far enough in advance to prevent the temperature from cycling or rising above and falling below the control point.

◆ Photoelectric Cell for Roll Wrapping Machine

The Cannard Company, Green Bay, Wis., has announced a development in connection with its wrapping machine for soft or hard wound toilet rolls which makes use of a photoelectric cell for the purpose of registering printed continuous webs. The arrangement provides for cutting the printed sheet to the exact length so that after the wrapper is applied to the roll the printing will register the same as in sheet form feeders. *(See illustration above).*

◆ Line of Protective Coatings

The Wailes Dove-Hermiston Corporation, 17 Battery Place, New York, N. Y., has announced a complete line of protective coatings for industry. The line includes Bitumastic Black Solution and Bitumastic Super-Service Black, products which have been used in maintenance work for years; Chromastic aluminum paint, a new product with a rust inhibiting vehicle that gives it an opaque yellow color; Bitumastic exterior-interior paint, a general all-purpose coating; Florex floor enamel; Bitugloss industrial enamel for machinery and equipment; Thermastic high heat aluminum; Chromastic metal primer, and Bitulite mill white.

◆ Improved Compressor Units

An improved line of tank-mounted compressor units for general industrial service has been developed by Worthington Pump and Machinery Corporation, Harrison, N. J.

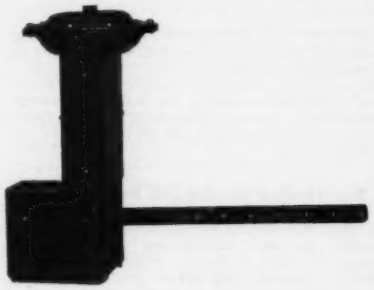
Single stage units are available with vertical compressors; two-stage units with angle-type compressors. The motor sizes of the single stage units range from ¼ to 5 hp., with displacements from 1.43 to 67 cubic feet per minute at a maximum pressure of 250 pounds per square inch; while those of the two-stage units range from ¾ to 10 hp., with displacements from 3.9 to 45 cubic feet per minute at the same maximum pressure.

A pressure switch, with a valve for

unloading the compressor when starting or stopping, is furnished on all models. Likewise, all units are equipped with Worthington feather valves; and most models are available with either vertical or horizontal tanks (air receivers).

◆ New Lever Motor

Taylor Instrument Companies, Rochester, N. Y., have announced a new lever motor, known as the MOTOSTEEL EVENACTION LEVER MOTOR, for which they cite the following features: All-steel welded construction; deeper diaphragm with larger area for greater power and smoothly modulated action; full stroke of push rod guided by ball bearing roller bearings; lever pivoted



in phosphor bronze bushings; number of take-off holes throughout length of lever so that force or travel of motor may be adjusted; power of either up-stroke or down-stroke increased or decreased by spring adjusting unit; lever action reversed by substituting another lever and transposing fixed and movable pivots; limit stops provided for both up-stroke and down-stroke; base drilled for mounting on floor, wall or ceiling; operation by remote manual control, by electro-pneumatic switch, or by pneumatically operated controller, also in parallel with diaphragm valve or other pneumatic equipment; and, sizes, expressed in terms of maximum damper areas which can be accurately positioned, of 25, 50 and 120 sq. ft.

The device is recommended by the manufacturer for the operation of dampers, lever operated valves, butterfly valves, electrical rheostat for variable speed motors, for the control of electrical equipment, or for the operation of any device by the conversion of pneumatic energy to linear or angular mechanical motion.

◆ Foam Preventive

Glyco Products Co., Inc., 148 Lafayette St., New York, N. Y., has announced a foam preventive under the name of FOAMEX for use in glue, casein and other solutions. The announcement stated that the use of the material prevents foaming without interfering with the other properties of the product and that it likewise is helpful in eliminating specks and pinholes; that the addition of as little as 1½ ounces of it to 12 gallons of solution is generally sufficient; and that the addition can be made to the water before making the solution or in the finished solution.

◆ Slate-Like Finish Enamel

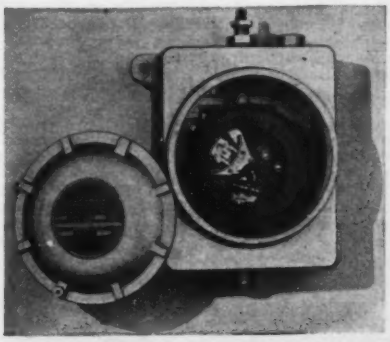
An air-drying lacquer enamel, which finishes fiber, wall board, cardboard, pressed paper, and other materials with a surface resembling slate, has been developed by Maas and Waldstein Company, Newark, N. J. This enamel, known as "Slatite," gives a finish which is said to be both washable and durable, and when worn, readily renewable by spraying on another coat.

◆ First Aid Kit for Burns

A first aid kit, specifically designed for emergency treatment of burns, has been developed by the Davis Emergency Equipment Company, 55 Van Dam Street, New York, N. Y. The kit, furnished in bright red enamel and labelled, "First Aid for Burns," contains 12 gauze compressors, which can be opened up in progressively larger sizes so that they can be used for covering small or large areas; 12 six-yard lengths of 4-inch bandage for holding the dressings in place; 6 5-oz. tubes of Tannoid, the tannic acid treatment for burns; and three packages of wooden applicators for applying the Tannoid. All items are packed in unit cartons and the supply as a whole is sufficient for burns involving the entire body.

◆ Explosion-Proof Automatic Controls

A line of explosion proof automatic controls has been announced by The Mercoid Corporation, 4213 Belmont Ave., Chicago, Ill. This line includes pressure controls ranging from 0 to 2500 lb., for use with air, oil, water, steam, and chemicals not injurious to brass or steel; temperature controls for temperatures from minus 30 deg. to plus 450 deg. Fahr.; transformer relays with sealed



mercury contacts and low voltage pilot circuit for frequently operating automatic equipment; and lever arm controls for mechanically opening and closing electric circuits. The lever arm controls are in three types—snap action, direct action and three position. In the snap action type, the Mercoid switch is locked in position by a snap action mechanism until the lever arm is raised or lowered to a definite point. The direct action type is used where only a small amount of power is available for actuating the control or where the movement of the lever is limited; while the three position type, also direct acting, independently operates two switches to open and close circuits at different positions on the lever arm, the position of each switch being adjustable with relation to the arm.

◆ Self-Contained Hydraulic Pulp Press

A. B. Farquhar Company, Ltd., York, Pa., has announced a 600-ton pulp press in which an independent pumping system is incorporated in the design. This pumping system is located on the top of the press. The press also is equipped with controls that permit automatic

switching of pre-pressing low tonnage to full tonnage. Tonnage of the side cylinders is 70 tons. Clearance between columns is 48 in. x 36 in. and daylight is 48 in. Bottom platen is equipped with table and spring mounted tracks. The design also includes standard features for rapid closing and return as well as an automatic feature which permits return of the press at the end of a stroke when maximum pressure is reached. Sometimes a press is equipped with a timing device.

◆ V-Belt Fastener

Flexible Steel Lacing Co., Chicago, Ill., has announced the development of a fastener for joining "C" Section V-belts of fabric core, cross weave construction. The design of the fastener is such that no metal touches the pulleys. Among the unique features of the fastener, cited by the manufacturer,

are: double rocker pin supported in bronze bushings, and method of holding end plate to belt end without materially weakening the belt or bulging its sides. Application of the fastener is said to be easily and rapidly made through the use of tools supplied by the manufacturer.

◆ New Catalogues and Publications

Black-Clawson Co., Hamilton, Ohio—Complete elimination of dryer felts and the saving in space are two features of the B-C vertical dryers which are brought forth in a new bulletin issued recently by the firm. Sample sheets of paper inserted in the bulletin are offered as evidence of the advantages of B-C dryers.

Bristol Co., Waterbury, Conn.—A telemetering system for operating and supervising engineers, including instruments for pressure and vacuum, water level, flow, voltage, remote totalizing of electric system loads, temperature and mechanical motion is described in a recent bulletin brought out by this firm. Blueprint drawings of the various types of Bristol Metameters are featured throughout.

Cochrane Corp., Philadelphia, Pa.—A 16-page loose-leaf data bulletin (No. 2675) illustrates and describes the liquid level controllers for services in the power and process fields put out by this firm. A number of models and combination arrangements available for the varied requirements encountered are described, with tables of dimensions, weights and list prices.

Continental Diamond Fibre Co., Newark, Del.—The construction and uses of the silent gears manufactured by this concern are described fully in a late publication by this company. Made of Celoron, a laminated plastic, these gears are designed for all sorts of industrial use.

E. M. Dart Manufacturing Co., Providence, R. I.—Complete data on the pipe, unions and fittings manufactured by this company are given in the new catalogue published by the firm. Full information on types, sizes and prices is included with color illustrations showing the distinctive full-bearing, true ball-joint construction.

Dominion Engineering Co., Montreal, Can.—Photographs, charts and diagrams, in addition to well-written material, serve to give the reader a clear idea of the Gearflex couplings manufactured by this firm. These couplings are especially designed to compensate for incidental conditions of parallel misalignment and to permit free-end float of the connected shafts, where necessary.

Downington Manufacturing Co., Downingtown, Pa.—The purpose, construction and installation of the suction felt roll manufactured by this firm is described fully in this new bulletin (Section 118) issued recently. Photographs and literature fully explain the principle of the machinery.

E. I. duPont de Nemours and Co., Wilmington, Del.—The development of a new blue pigment, known as Monastral Fast Blue BS, is described in a booklet issued recently by this firm. Illustrations of the various types of usages for this new blue are featured throughout this interesting 20-page publication.

General Electric Co., Schenectady, N. Y. —*Modern Switchgear* is the title of this new bulletin (GEa-1302B) brought out by this firm. Various types of switchgear equipments, switches and devices, air circuit breakers, oil circuit breakers and switchgear relays are illustrated and their working principles explained. For the benefit of those desiring further information perforated postcards are attached to the rear of the loose-leaf catalogue. Material will be sent promptly on receipt of these cards by the company.

B. F. Goodrich Co., Akron, Ohio—A handy little data book has recently been issued by this firm. Various types of truck and bus tires are illustrated and all the specifications are listed for each type. This little book is very informative and contains valuable data on specific types of tires for distinct classes of services.

Link-Belt Co., Chicago, Ill.—A new 8-page illustrated list price book (No. 1622) has been completed by this company on the subject of cast-iron pulleys for power transmission, giving pertinent data on solid and split, single and multiple arm machine moulded pulleys, with and without rubber lagging.

Morse Chain Co., Ithaca, N. Y.—An attractive catalogue containing much valuable material concerning the chain drives manufactured by this company has been issued recently by the firm. Detailed reading matter, photographs, charts, tables and drawings give the reader a complete picture of the company's product.

Paper and Industrial Appliances, Inc., New York, N. Y.—A broadside which describes the Thorsen-Hery beater, a construction which combines functions of both beating and Jordaning, has been issued recently by this firm. Micro-photographs and diagrams explain the principle of the construction and use of the beater.

Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.—A very attractive bulletin dealing with the manufacture of caustic soda has been published by this company. Bound with a shiny blue and yellow cover, this publication presents a complete picture of their process through 24 pages of well-written material, charts, diagrams and photographs.

Pittsburgh Piping and Equipment Co., Pittsburgh, Pa.—Various uses of stainless piping are illustrated in a pamphlet issued by this firm. The company's piping system in use at the Crossett mill is described by use of explanatory written material and photographs.

Rockwood Manufacturing Co., Indianapolis, Ind.—A late publication (No. 795) presents a series of tables whereby the single groove V-belts manufactured by this company are arranged numerically with sizes and list prices compared with other manufacturer's data on the same product.

W. S. Tyler Co., Cleveland, Ohio—Various types of screens manufactured by this company are described through use of cross-cut drawings, photographs and written material in a new publication by this company entitled, *Accuracy and Economy in Wet Screening.*

Warren Steam Pump Co., Warren, Mass. —The stock pumps and liquor pumps manufactured by this company are fully described in two recent broadsides issued recently by the firm. Cross-cut illustrations of both types of pumps are featured in both presentations.

BOOKS

Design of Welded Piping—This publication, a 200-page (6x9) booklet with a paper cover, contains extensive handbook information on design and layout of piping and welded connections. Among the subjects treated by it are: engineering aspects of welded piping; joint design for steel and wrought iron piping; cast iron, galvanized iron, stainless steel and non-ferrous piping; piping layout and drawing; specifications for welded piping; and an extensive appendix which, among other things, includes notes on American tentative standard for wrought iron and wrought steel pipe; data on welded fittings and a glossary of terms used.

Swedish Timber and Woodpulp Journal —The annual issue of this journal has been issued recently and contains a great many interesting articles written both in Swedish and English. The annual numbers of the journal are intended to give a survey of the preceding year from commercial and technical points of view; resembling in this respect a yearbook. The 1937 issue deals with the technical devoiopment of the pulp and paper industries of the Scandinavian countries in a very complete manner. Technical questions and news items are also dealt with. The annual issue can be obtained from the A. B. Svensk Travaru-Tidning, Kungsgatan 17, Stockholm. The price is 3s 6d., postage included.

Stories of American Industry — The United States Department of Commerce has issued this interesting booklet which tells the story of industrial romances in America, including that of the paper industry. Copies may be secured from the Government Printing Office, Washington, D. C., for 10 cents.

The Finnish Timber and Paper Calendar —A 1937 edition, the sixth in order of succession, of this publication has been released by the publishers. It has been edited by Onni O. Ojala, editor of the FINNISH PAPER and TIMBER JOURNAL, in collaboration with other experts of the trade. The book, in its typical blue cover and of the same page size as the previous edition, is a work of considerably more than 500 pages. These pages are divided broadly into six sections—general; sawmill; plywood and spool; cellulose, paper, mechanical woodpulp, cardboard and wallboard mills; contract forms; and miscellaneous. Some pertinent economic and other information on Finland is contained in the general section; while the next three sections contain typical directory information on each of the respective fields covered by them. The section on contract forms includes forms in use for shipments of sawn timber, pitprops, plywood, and pulp and paper; and the sixth section gives information about shipping marks and on sawmills according to shipping districts and ports as well as index to Finnish paper and pulp mills according to products. The book is priced at 12 s. net per copy, postpaid, by the publishers—The Finnish Timber and Paper Calendar, Alexandersgaten 36B, Helsingfors, Finland.

Directory of Paper Makers of Great Britian and Ireland—Marchant Singer & Co., Publishers, 15, Nicholas Lane, London, E. C. 4, England, has released the 1937 edition of this directory. The book has been brought up to date. Additions have been made in trade designations. There also have been withdrawals and transfers of names in sections covering watermarks and trade names. In addition to these two sections, there are individual sections covering paper and board mills in Great Britain and Ireland; a list of paper enamellers, surfacers, etc., and converters of paper; a list of mill representatives in London and the provinces; a list of the paper mills by counties; a classification of paper mills by products manufactured; a list of rag merchants; a list of British clay producers and merchants; and a section covering paper trade customs and a listing of members of Paper Makers' Association of Great Britain and Ireland, of the Paper Exporters' Section of the London Chamber of Commerce, of the officers and allied associations of the Britsh Wood Pulp Associaton and of the various Paper and Allied Trades Associations with names and addresses of the secretaries. The book is priced by the publishers at 5/8 per copy.

◆ Slogan Contest Feature of Chemical Exposition

A slogan contest with a first prize of $250.00 in cash is announced by the management of the Sixteenth Exposition of Chemical Industries which will be held at Grand Central Palace, New York, December 6 to 11, 1937. The object of the contest is to secure for the chemical and chemical process industries a brief descriptive expression encompassing their aims and suggesting their manifold benefits. The work of the chemical industries has an effect, directly or indirectly, on practically every phase of human activity.

As stated in the contest announcement which has just been made public, the chemical industries are themselves creative. They establish new industries and rehabilitate old ones. They create employment within themselves and in other industries and are the manufacturers of diversified products of limitless use. These products serve to alleviate suffering, bring health and well-being, extend civilization, increase nature's productivity, and create national security and wealth. In their peaceful applications, which are of course predominant, "the chemical industries contribute better than all else to that state of universal well-being and happiness which is ascribed to the Utopia of a perfected civilization."

Eleven prizes in all, totaling $300.00 will be awarded by the Sixteenth Exposition to Chemical Industries in this unusual contest. A first prize of $250.00 in cash will be presented to the person submitting the slogan considered best in the opinion of the judges and there will be ten prizes of $5.00 each for the ten next best slogans. The contest will be judged by a jury consisting of members of the Advisory Committee of the Exposition.

The Chemical Exposition slogan contest takes on an international aspect through the fact that it is open to any person residing in the United States of America, Canada or Mexico. Any number of suggested slogans may be submitted, providing certain rules as stated in the contest announcement are followed. The contest closes on September 18, 1937. Awards will be announced as soon as practicable after the close of the contest and the actual presentation of the prizes will be made at the Exposition of Chemical Industries on Monday evening, December 6, 1937, at 8:00 p. m.

In sponsoring this unique contest, the management of the Exposition of Chemical Industries hopes to provide a verbal rallying point or slogan which will be effective in symbolizing the accomplishments and coördinating the progress of the chemical industries as a whole. It is expected that the winning slogan or slogans, which the Exposition management will make available to all units in the chemical industry, will be utilized in the advertising and publicity programs of a great many companies. The total effect, the sponsors believe, will be increased understanding of the scope of chemistry and chemical engineering as related to the progress of mankind. The slogan will bring this understanding to a focus.

Another feature of the Exposition will be the award of a prize of $250.00 in cash to the person submitting the "best descriptive expression encompassing the purposes and the benefits redounding to the common good from the activities of the chemical industries." It is felt that the chemical industries contribute better than all else to the progress and happiness of mankind and to summarize the broad aspects of this conclusion a condensed expression or slogan is desired. The accepted slogan will be made available to the chemical industry as a whole. Rules of the contest will subsequently be announced.

Raw materials, finished products, plant equipment, machinery and apparatus will constitute major sections of the Exposition. Metals and alloys will be featured, likewise the newer synthetic plastics and molded products. The standard applications of glass as an industrial commodity will be augmented by the newest forms, including fibrous glass, which is used for the filtering of air and liquids. Other varieties of this new fibrous glass can be drawn into filaments one-tenth the size of a human hair and can be made into mats which serve as separator plates in storage batteries.

Unit processes of chemical engineering will be represented by a broad range of exhibits. These will include sections devoted to the handling of fuels and the production of power.

REDUCE
PIPING COSTS
with ARMCO Welded Fittings

• Whether you need a few hundred feet of pipe for a replacement or several thousand feet for a new line . . . consider the economy of combining Armco welded fittings with straight runs of Spiral Welded Pipe.

This way you eliminate unnecessary flanges, simplify erection and reduce the possibility of joint leakage. Then, too, piping designed in this manner is much easier to support or suspend than assemblies having greater weight and a greater number of joints.

Ordering is simplicity itself. Just mail your specifications to have Armco Spiral Welded Pipe and fittings "tailored" to your requirements. And remember to ask for your copy of the new 42-page Armco pipe handbook. It will help you save money and boost the efficiency of your piping. The American Rolling Mill Company, Pipe Sales Division, 709 Curtis Street, Middletown, Ohio.

ARMCO

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SPIRAL WELDED PIPE

THE PUSEY AND JONES CORPORATION

Established 1848

WILMINGTON, DELAWARE

GUARANTEED REBUILT EQUIPMENT

SLIPRING MTRS.	SYNCHRONOUS MTRS.	MG SETS
1—500 hp Al. Ch. 450 rpm	1—1000 hp Cr. Wh. 600 rpm	1—500 KW Sync. compl.
2—300 hp Wgse. 360 rpm	1—750 hp El. Mch. 514 rpm	2—200 KW Sync. compl.
2—200 hp G. E. 600 rpm	1—300 hp Al. Ch. 900 rpm	Many smaller—all capac.
1—200 hp Burk 900 rpm	1—250 hp El. Mch. 1200 rpm	TURBO-GENERATORS
3—150 hp G. E. 600 rpm	1—200 hp Cr. Wh. 600 rpm	2—1250 KW Condens.
SPECIAL	1—150 hp Brk. 600 rpm	1— 750 KW Condens.
1—300 hp G. E. 380 rpm squir-cage mill motor	1—75 hp G. E. 1200 rpm	AC GENERATORS
Many others in stock	ENG. GEN. SETS	1—750 Cr. Wh. 600 rpm
	1—225 KVA & 1-150 KVA. stm	1—500 KW El. Mch. 514 rpm (Complete stock smaller)

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JONES-BERTRAMS
★ PATENT **BEATER**
E. D. JONES & SONS COMPANY - PITTSFIELD, MASS.

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Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment. Complete power plants to meet any operating conditions of Pulp and Paper mills or other Industrial service. Engineering and Construction.
Satisfactory Services Always Guaranteed.

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Power Specialists
Monadnock Bldg., Chicago

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Carthage, New York
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Machinery for Ground Wood and Chemical Pulp

MORRIS
CENTRIFUGAL PUMPS
Write for interesting and useful bulletin on Non-Clogging Pumps for handling pulp, and centrifugal pumps for other mill processes and services
MORRIS MACHINE WORKS, Baldwinsville, N. Y.

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THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
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PULP MILL MACH'Y ◆ FINISHING ROOM MACH'Y
◆ FRICTION CLUTCHES ◆

WIENER REFINERS
STOCK REGULATING VALVES
ENGINEERING AND DEVELOPING
WIENER REFINER ENGINEERING CO.
OSWEGO, NEW YORK

It Pays to Read the Advertising in
THE PAPER INDUSTRY

DRY PAPER EVENLY

STICKLE AUTOMATIC STEAM CONTROLS
DRAINAGE SYSTEMS FOR DRYERS AND HEATING SYSTEMS
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STICKLE STEAM SPECIALTIES COMPANY, 2217 VALLEY AVENUE, INDIANAPOLIS, IND.

In this section there will be exhibits devoted to the latest advances in the scientific combustion of the various types of fuel. The equipment for combustion will feature furnaces, kilns, refractories, and the control instruments adapted to the regulation of these processes. Crushing, grinding, and mechanical separation will be represented by sifters, agitators, classifiers, and ball mills. Classification based on magnetic properties of the materials handled will also be featured.

Filtration, evaporation and drying will be the subject of many exhibits. Apparatus will include filters of every type and evaporating equipment applicable to the chemical and food industries. Drying equipment will be shown in its relation to every phase of the pharmaceutical industry and there will be special reference to the processing of foods.

◆ ◆ ◆

◆ Interest Centers on TAPPI Fall Meeting

With the colorful history of Savannah, Georgia, as a background, that city is making extensive arrangements to entertain delegates to the fall meeting of the Technical Association of the Pulp and Paper Industry when they visit the southern metropolis October 18, 19 and 20. The De Soto Hotel will be convention headquarters and the hospitality of the entire city will be thrown open to the visitors.

Anyone desiring general information about the convention should address D. G. Moon, chairman Convention Committee, P. O. Box 703, Savannah. There are many routes to Savannah whether one travels by rail, water or by auto. For information concerning routes, address Savannah Chamber of Commerce.

Although the program is not completed, the following outline gives an idea of the high points of interest. In addition, the women visitors will enjoy many interesting and entertaining trips, luncheons, sports and sightseeing events.

TECHNICAL PROGRAM

Monday—

Papers on Forest Management and Economics.

TAPPI Luncheon with speaker—"Forestry Problems in the South."

Tuesday—

Papers on Pulping.

TAPPI Luncheon with speaker—"History of Paper Industry in the South."

Wednesday—

Papers on Paper Manufacture.

WOODS AND MILL VISITS

Monday—

Pulpwood and Turpentine Operations at Palmetto Bluff, S. C.

Tuesday—

Inspection of Union Bag and Paper Corporation Mill and Pulp and Paper Laboratory of Savannah.

SOCIAL PROGRAM

Monday—

Return from Palmetto Bluff via Inland Waterway, entertainment and refreshments on board the Steamer Clivedon.

Reception, Hotel De Soto, followed by Formal Ball and Banquet, courtesy of the City of Savannah.

Tuesday—

Reception and Costume Dinner Dance at the De Soto Hotel, courtesy TAPPI—A Crinoline Party.

Wednesday—

Visit to Savannah Beach, Oyster Roast, courtesy Chatham County Commissioners.

Thursday—

Visit to Hercules Naval Stores Plant at Brunswick, Georgia, followed by Luncheon, Golf and Swimming at Sea Island Beach.

Friday—

Slash Pine Forest Festival, Waycross, Ga.

RYERSON

IMMEDIATE STEEL FOR MAINTENANCE AND REPAIR

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Bars, Shapes, Structurals, Rails, Plates, Sheets—Steel, Copper, Alloy and Armco Ingot Iron—Plain, Galv. and Corrugated; Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Mechanical Tubing, Boiler Tubes; Boiler Fittings, Concrete Reinforcing, Welding Rods, Solder, Refined Iron, Stainless Steel; Babbitt Metal, Brass and Copper, Alloy Steel, Tool Steel, Floor Plates, Safety Treads

Write for the Ryerson Stock List

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Jersey City, Philadelphia, Boston

STEEL

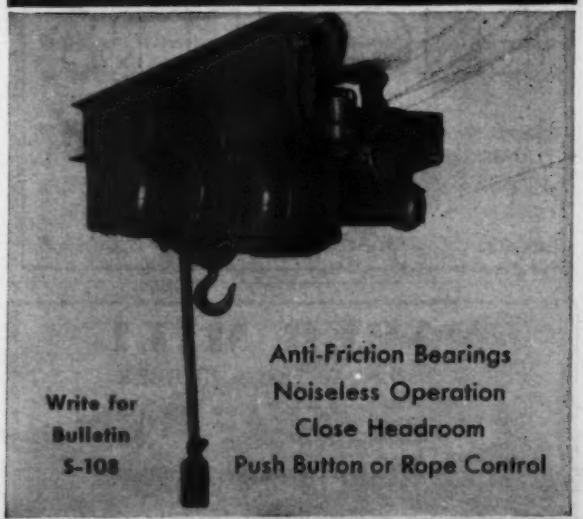
RYERTEX BEARINGS —CLEANER —LAST LONGER

They are water lubricated • Consume less power • Help produce cleaner stock • Quickly replaced • Will run submerged in pulp stock • Last longer • Practically unaffected by acid solution. Write for Bulletin 42

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Jersey City, Philadelphia, Boston

RYERSON

DIRECT WORM DRIVE ELECTRIC HOIST



Write for Bulletin S-108

Anti-Friction Bearings
Noiseless Operation
Close Headroom
Push Button or Rope Control

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Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

PULP AND PAPER MILLS
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Pulp and Paper Mill Screens

of STAINLESS STEEL—COPPER—BRONZE—
MONEL—CHEMICAL RESISTING ALLOYS

Perforations that are accurate in size and alignment
ANY METAL ·· ANY PERFORATION

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THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL

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Blank Head

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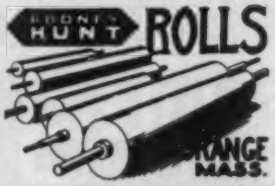
"Shaf-Tite" Rolls

RODNEY HUNT ROLLS



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TANKS, VATS, ETC.
ENDLESS FLAT WASHERS

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High Density BEATERS

Hundreds of highly successful installations in service.

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DAYTON, OHIO, U. S. A.

The Paper Industry Safety Contest

Tentative 12-mo. Cum. Scores as of June 30, 1937

8 Mills Finish With Perfect Scores

PERFECT SCORE

Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B			
GROUP C			
GROUP D	Bird & Son, Inc.	Phillippsdale	Rhode Island
	Southern Extract Company	Knoxville	Tennessee
	Rogers Fibre Company, Inc.	Bar Mills	Maine
	The Mead Corporation	Nashville	Tennessee
	Central Fibre Products Co.	Vincennes	Indiana
	International Paper Company	Riley Mill	Riley, Maine

Division II

Container Corp. of America	Anderson	Indiana
Bemis Brother Bag Company	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-106	1	9	2.972
	P- 10	2	6	3.536
	P- 28	3	20	4.123
	P-121	4	8	4.385
	P- 30	5	12	5.865
	P- 27	6	20	6.177
	P- 25	7	8	6.402
	P- 19	8	11	6.970
	P- 58	9	11	7.527
	P- 18	10	19	7.787
	P- 84	11	17	8.330
	P- 13	12	16	8.571
	P- 12	13	15	9.276
	P- 23	14	15	9.472
	P- 11	15	13	9.510
	P- 44	16	30	10.216
	P- 22	17	13	10.430
	P- 69	18	19	11.216
	P- 21	19	15	12.028
	P- 64	20	26	12.353
	P- 9	21	38	12.508
	P- 2	22	20	12.752
	P- 1	23	42	12.847
	P-107	24	18	14.218
	P- 62	25	32	14.426
	P- 67	26	40	15.074
	P- 73	27	51	19.271
	P-101	28	33	20.135
	P- 87	29	49	23.989
	P-102	30	50	25.127
	P- 95	31	36	27.049
	P-127	32	39	27.770
	P- 40	33	46	32.312
	P-126	34	107	32.963
	P- 32	35	66	47.262
	P- 71	36	69	47.583
GROUP B	P- 60	1	1	.954
	P- 97	2	1	1.483
	P- 15	3	2	2.201
	P-119	4	2	2.514
	P -51	5	4	4.545
	P- 68	6	5	4.957
	P- 59	7	6	6.936
	P- 72	8	7	7.140
	P- 26	9	9	8.104
	P- 4	10	8	9.120
	P- 70	11	10	10.280
	P- 3	12	11	10.775
	P-112	13	12	11.075
	P- 16	14	23	24.404
	P-122	15	26	25.991
	P-104	16	24	27.254
	P-128	17	33	30.466
	P-124	18	31	33.308
	P- 82	19	36	35.541
	P- 45	20	50	41.882
	P- 46	21	42	45.578
	P-123	22	59	58.246
GROUP C	P- 55	1	2	2.813
	P- 52	2	3	5.455
	P- 88	3	6	9.152
	P- 89	4	6	10.331
	P-116	5	4	10.841
	P- 61	6	7	12.015
	P- 37	7	9	13.592
	P- 5	8	5	13.780
	P- 43	9	7	14.635
	P-103	10	7	15.270
	P- 56	11	9	16.439
	P- 14	12	8	17.037
	P- 39	13	15	21.151
	P- 41	14	15	26.811
	P- 94	15	12	27.190
	P- 6	16	10	27.611
	P- 50	17	12	28.301
	P- 29	18	23	34.657
	P- 49	19	14	37.465
	P- 34	20	19	37.622
	P- 80	21	16	42.261
	P-113	22	27	45.580
	P- 17	23	23	48.747
	P- 33	24	27	49.600
	P- 47	25	28	53.207
	P-111	26	30	59.757
	P- 48	27	41	66.260
GROUP D	P- 90	7	1	4.191
	P- 93	8	1	4.805
	P-110	9	1	8.102
	P-117	10	3	10.312
	P- 98	11	3	11.943
	P- 85	12	1	12.630
	P- 38	13	2	15.220
	P-109	14	3	16.119
	P- 36	15	7	25.368
	P- 86	16	5	27.020
	P-106	17	8	27.237
	P- 42	18	6	27.248
	P-125	19	5	28.492
	P- 99	20	7	34.846
	P- 91	21	13	36.212
	P- 81	22	11	40.487
	P- 65	23	8	42.354
	P-118	24	11	46.894
	P-129	25	32	98.604
	P- 53	26	Withdrawn—Reports Missing	

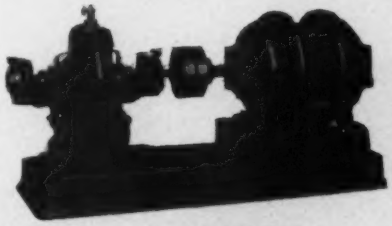
Division II

R- 2	3	3	3.551
R-19	4	2	4.341
R-20	5	6	4.736
R- 6	6	7	4.903
R-10	7	3	5.327
R-15	8	1	5.994
R- 3	9	3	10.859
R-18	10	4	10.928
R- 1	11	6	11.314
R-21	12	12	13.157
R-13	13	4	15.541
R- 5	14	17	18.031
R-11	15	4	18.638
R-14	16	4	37.885

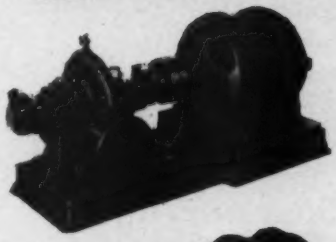
No June Report—11 months, total only: Southern Extract Co., Knoxville, Tenn., P-60, P-67, P-85, P-127, P-126, P-97, P-68, P-70, R-13, R-5

WORTHINGTON

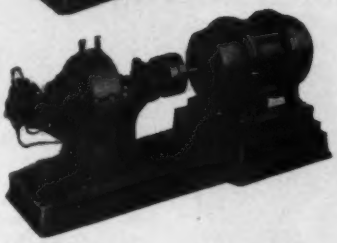
HIGH EFFICIENCY CENTRIFUGAL PUMPS



Type R
Single-Stage...
Single-Suction
40 to 350 gal. per min.
45 to 240 ft. head



Type L
Single-Stage...
Double-Suction
125 to 1700 gal. per min.
30 to 155 ft. head



Type U
Two-Stage...
Single-Suction
25 to 130 gal. per min.
130 to 368 ft. head

- Horizontally-split Casings... Interior inspection without disturbing piping or pump alignment.
- Heavy Duty... For the toughest applications.
- Ball Bearings... Negligible friction, lowest maintenance.
- Volute Casing... Of smooth, accurate castings, for maximum hydraulic efficiency.
- Stuffing Boxes... Extra deep and pressure-water-sealed against entering air leakage.
- Motors Nationally Approved... Supplied by Worthington... Fully guaranteed... Nation-wide service.

IN STOCK!
Complete with motors
For immediate shipment
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WORTHINGTON PUMP AND MACHINERY CORPORATION
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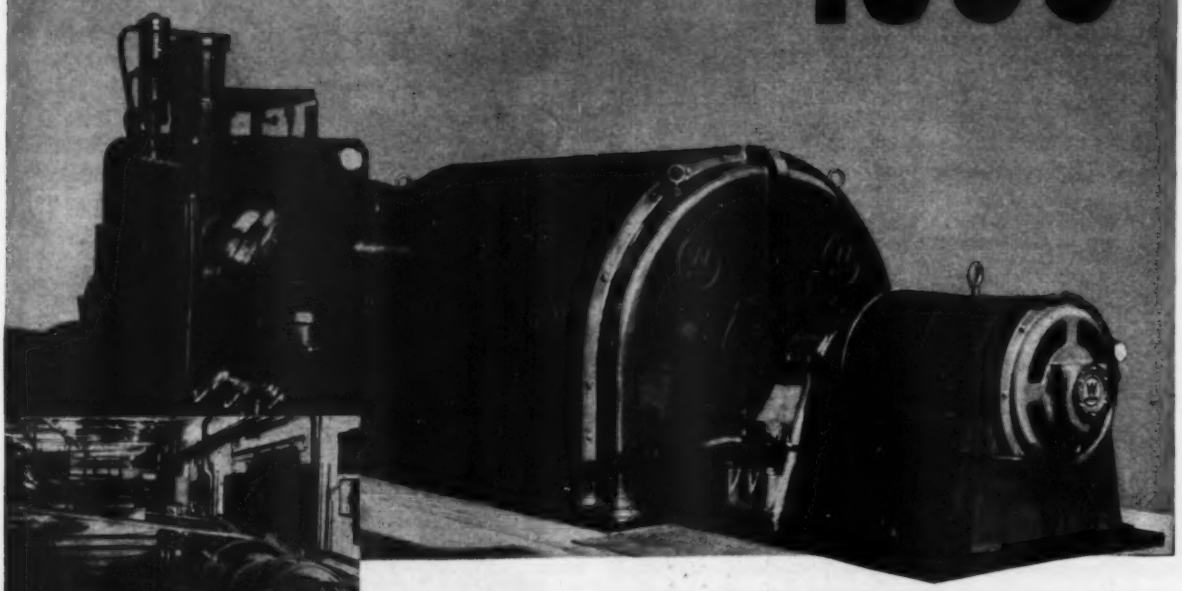
CP7-19

MONTHLY SAVINGS $4300



Five 60-hp. Westinghouse gearmotors on beater drives give low output speed at the high efficiency and excellent power factor of the high speed motor.

Westinghouse electronic speed regulator on American Boxboard's single-motor paper machine improves paper quality, giving uniform caliper and texture through positive speed control.

UNDIVIDED RESPONSIBILITY MULTIPLIES THE VALUE of WESTINGHOUSE SERVICE

...as AMERICAN BOXBOARD turns to Westinghouse for...

Modernization

When a paper mill effects savings of $4300 a month through modernization, that's *news*! Yet the carefully-kept records of Mr. I. M. Hilliard, Chief Engineer of the American Boxboard Company, Grand Rapids, Michigan, confirm these facts over an eighteen-month period.

Complete electrification of the Company's No. 1 mill at Grand Rapids, Michigan, included the installation of a new 3000 kw. bleeder turbine to replace antiquated small turbines and steam engines previously used. It is estimated that the modernization will pay for itself in four years.

For this equipment, the turbine generator as well as the individual gearmotors on beater and Jordan drives, complete responsibility was placed with Westinghouse. For new mills or modernization jobs like this, Westinghouse experience and apparatus is unmatched. It will pay you to take advantage of it in connection with any projected plans you may have. For competent consultation, call your nearest Westinghouse office. J 93230

Westinghouse Elec., East Pittsburgh, Pa.

FROM POWER SUPPLY TO DRIVEN MACHINE

Specify **Westinghouse**

POWER

GENERATION + UTILIZATION + MAINTENANCE

By W. S. JOULE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worthwhile practices suggest new ideas and wider usages of equipment.

◆ Starting a New Air Compressor

When starting a new air compressor, turn the machine over a few times by hand to see that it works freely and that everything is clear. This is an important precaution, as accidents have resulted by starting a newly erected machine without first having turned it through at least one revolution to see that everything is clear.

After compressor is in proper condition, turn on a full supply of cooling water. The compressor should be run for a while at reduced air pressure and should be closely watched at the start, giving particular attention to the crank case. Even though the compressor has been carefully cleaned there is sure to be more or less dirt remaining, which will be washed out by the circulation of the oil. All of this dirty oil must be removed. The bottoms of the crank cases should again be wiped out and all sediment removed. A fresh supply of oil should be put in, which will remain clean for a longer time but when this also becomes dirty it should be removed. After the compressor has been running for a while, it should not be necessary to change the oil oftener than once a month.

◆ Blowoff Piping

In order to allow for the proper removal of a scum, precipitated scale forming materials and mud, every steam boiler is provided with one or more blowoff connections. These blowoff connections are of two general types, the surface blowoff, by means of which the scum at the surface of the water is removed, and the bottom blowoff, by means of which the sludge and mud which collects at the bottom of the boiler is discharged.

Bottom blowoff connections are always made at the lowest part of the water space, and because of the severe service to which they are subjected are made extra heavy. Different methods are employed for protecting blowoff pipe wherever it is exposed to the fire in the combustion chamber. In most water tube boilers it is located well away from the hottest part of the fire so that it is only necessary here to consider the blowoff piping of a return tubular boiler.

There are two common methods of arranging blowoff piping. In the first instance, the descending pipe is protected from the heat of the gases by a sleeve of fire brick(although a V-shaped pier of fire brick, with the point toward the front of the boiler, is sometimes employed. The horizontal pipe is bricked over or covered with a coil of plaited asbestos rope ½ to ¾ in. in diameter. The bottom blowoff pipe may be provided with a circulating pipe which enters the rear head of the boiler. Where the blowoff pipe passes through the rear wall of the setting, it should be surrounded by a sleeve, so that it will be free to move. To prevent air leaking in, the space between the sleeve and the pipe should be packed lightly with asbestos rope or a similar substance without interfering with the free movement of the pipe.

Diameters of blowoff pipes for fire tube boilers are commonly as follows: 1½-in. pipe for boilers up to 42 in. in diameter; 2-in. pipe for boilers up to 60 in. in diameter, and 2½-in. pipe for larger boilers. In low-pressure and water-tube boilers, the size of the blowoff is determined by the manufacturer, a tapped boss at the lowest point indicating the size of pipe to be used.

◆ Teaching Tricks of the Trade

Every man in a subordinate position is entitled to a certain amount of instruction or teaching from his superior. No man in an executive position wants the work under his direction to stop the minute his back is turned, yet he cannot expect much else, if his men are not taught the whys and wherefores of the work they are doing.

In the power plant, greatest success will be attained by the men who gain the confidence of their assistants, who are able to instruct without offense and hold their men's interest in their work by a process of continuously developing them for more intricate and important work. A little display of the milk of human kindness will right many a wrong.

◆ Combustion Efficiency Determined by Excess Air

Experience has shown that the only feasible guide for combustion efficiency is to determine the percentage of excess air. The desired percentage of excess air for best combustion efficiency is that which will maintain the total losses due to excess air and unburned fuel at a minimum. Or, if the brick work is the essential factor, as it often is, one should maintain the lowest percentage of excess air and yet not encounter too great an expense in maintaining the brick work and furnace lining.

The steam-flow-air-flow relation is a positive, instantaneous and correct indication of the percentage of excess air and is well adapted as a guide for either hand or automatic control. The rate of steam generated is in reality the reading of a calorimeter showing the rate at which B.t.u. are developed in a furnace. The flow of air as indicated by the differential pressure across the boiler with proper precautions, is a measure of the rate of air supplied to develop the B.t.u. Fortunately the B.t.u. per pound of air used in combustion is substantially constant for all commercial fuels and the relation between steam flow and air flow is, in reality, a relation between the B.t.u. supplied to the furnace in the fuel and the air supplied to the furnace for burning it with the desired percentage of excess air.

◆ Installation of Silent Chain Drives

Before putting the chain on sprockets, the shafts must be checked to make sure that they are parallel and level. The sprockets themselves must be placed on these parallel and level shafts, so that they are in perfect alignment. This can be checked with a string or straightedge across the face of the sprockets. Sprockets should be located as near as possible to shaft bearings. After the drive is started, it is advisable to make a second checking for alignment by observing the guide links in the chain. The wear on these guide links should be equally distributed on both sides. If more wear shows on one side than the other it indicates that the sprockets are not in alignment.

Sprocket keys should be securely in place and set screws tight. If the chain has been furnished endless, i. e., with ends joined together, the chain must be slipped over the sprockets before their installation on the shafts. If, however, the chain has been furnished with open ends, i. e., ends not joined together, as is necessary in case of line shafts and other drives where endless chain could not otherwise be conveniently installed, the chain must be placed over the sprockets and the two ends joined together.

CHLORINE DISPERSION*

Pennsylvania Salt made available to pulp mills this novel and efficient method of introducing elemental chlorine into the bleaching of pulp. The method involves the production and use of chlorine dispersions in excess of the solubility of chlorine in water, and the feeding of the unbroken dispersion to pulp in multi-stage bleaching. It has been used successfully by a number of mills for over four years.

Pennsylvania Salt retains exclusive licensing rights to this method in the United States.

*U. S. Patent 1,971,241 dated August 21, 1934. Also fully protected in twelve foreign countries.

Our technical experts are immediately available to help fit our products to your particular requirements, and we will gladly cooperate with mills who desire to use our Chlorine Dispersion method.

PENNSYLVANIA SALT MANUFACTURING COMPANY · Est. 1850
WIDENER BUILDING, PHILADELPHIA, PA.
Offices: New York · Chicago · St. Louis · Pittsburgh · Tacoma · Wyandotte

PENNSYLVANIA SALT Chemicals

TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

IN THE PAPER INDUSTRY

◆ Lignin in Straw

This article brings further experimental evidence to bear on the problem of whether or not there is lignin in straws. Hilpert has claimed that lignin in the usual sense is non-existent, and even Schwalbe, who states that there is no question of the preëxistence of lignin in wood, points out the lack of clear-cut evidence regarding the existence or non-existence of lignin in straw. Besides his

earlier studies on straw through alcoholic nitration, has now also treated rye straw with 72 per cent H_2SO_4 at minus 10 deg. C. with stirring for varying time periods, and obtained an ash-free residue of about 6.2 per cent. This still included broken-down cellular elements exclusive of the lignin residue, as shown in Figure 1 (which indicates pitted vessels, epidermal cells, etc.). Some of these are definitely lignified (phloroglucinol reaction), and the entire residue gives tests for lignin even after drying at 100 deg. C. Roughly, 10 per cent silicious matter is found in the sulphuric acid insoluble portion. Hilpert's statement that rye straw is completely soluble in the acid thus appears to be unfounded. Coupled with the results of previous experimental data, the author concludes that lignin to the extent of about 5 per cent of the straw is present in rye. Karl Kürschner. Papier-Fabr. 35 (Tech. Tiel) 101-2, 115-6 (1937).

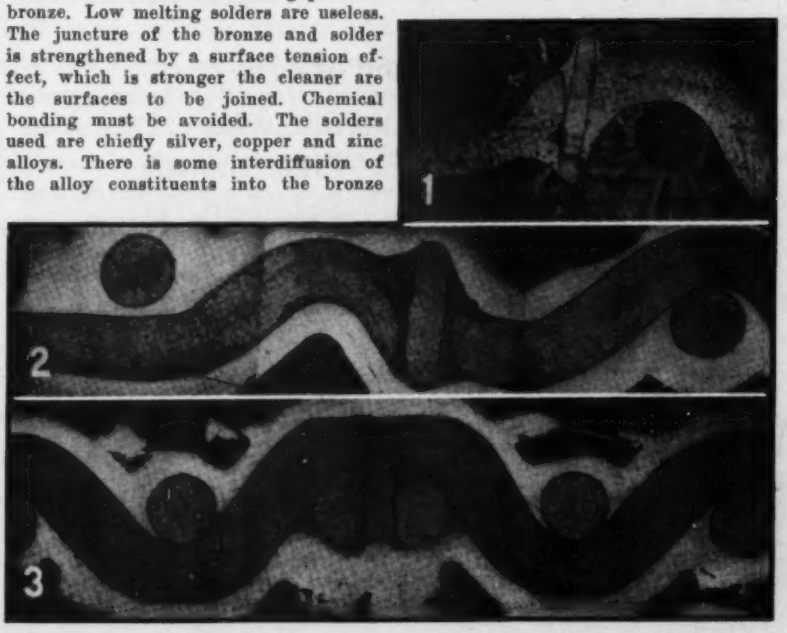
◆ Analysis of Impregnating Agents in Paper

The author outlines simple orientating tests that give clues to the presence of certain special impregnating agents. With many papers, a systematic scheme of analysis devised by A. Herzog (Mikrochemische Papieruntersuchung, published in 1935, and reviewed in THE PAPER INDUSTRY) may be used. In the presence of rubber, however, the following scheme is suggested:—the paper is extracted with the following solvents in the order named:—(a) cold, dilute alcohol (which extracts glycerol, glucose, rosin, a part of the soaps, and certain dyes); (b) hot water (which removes dextrins, starch, glue, soaps and gums); (c) acetone (which extracts a part of the resins, soluble portions of the rubber, fats, oils, waxes, cellulose acetate and nitrate, mineral oils, paraffin, ceresin, soluble parts of lignite, coal tar oils and pitches, certain dyes, and free sulphur); (d) pyridine (which extracts brown coal and coal tar pitch); (e) chloroform (that removes unvulcanized rubber, chloroprene, and soluble artificial rubber); (f) alcoholic potash (which dissolves saponified natural and synthetic resins, insoluble in acetone, varnishes, oxidized fatty oils, rubber substitutes and vulcanizers) and (g) anisole or cresol (which extracts vulcanized rubber and certain portions of soluble synthetic rubber). This is of course a general scheme and clean cut separations are not expected. Special tests for rubber in the chloroform fraction are briefly described. The residue from these solvents contains the fiber admixed with some artificial rubber or highly polymerized compounds resembling rubber, containing chlorine or sulphur, Bakelite, fillers, inorganic pigments, etc. Fritz Burgstaller. Papier-Fabr. 35 (Tech.T1) 46-8, 52-4 (1937).

◆ The Fourdrinier Wire

This is the seventh in a series of papers (Cf. THE PAPER INDUSTRY, p. 331 June 1937). Seams in the wire may be fixed by soldering as well as welding. A hard or silver solder is used, and its point of fusion is below the melting point of bronze. Low melting solders are useless. The juncture of the bronze and solder is strengthened by a surface tension effect, which is stronger the cleaner are the surfaces to be joined. Chemical bonding must be avoided. The solders used are chiefly silver, copper and zinc alloys. There is some interdiffusion of the alloy constituents into the bronze of the wire. The solder film is kept thin, and the seams are of two types (A) the ribbon or tape seam and (B) the two weft or double-shot seam. In (A) the warps of the two ends of the cloth are soldered to a bronze ribbon. Stress from the wire transmitted from warp to warp through the medium of this ribbon. The tape simulates a weft wire, and on the paper machine the drainage becomes very much like that in the body of the cloth. The ribbon is thin and the warp ends are usually very close to it, joined with the thinnest possible films of solder, a skin of which is also around the end portion of each warp and around the ribbon. This increases the strength of the seam. Figures 1 and 2 show vertical sections through warps of such seams. In the second case (Figure 2) the warp ends are left much longer, and the seam is more flexible, and the draininge is better. However, in this case also, a very high suction pressure gives a decided wire mark and may even cause perforations in the sheet.

Soldering method (B) entails cutting or grinding the warp ends back to the first weft on either side, and in removing (up to) one half of these weft wires. The two partial wefts are then joined together by solder. The warps are joined to those parts of the weft that they touch, and the warp ends of one side are soldered to those of the other. This is shown in Figure 3 where, according to the author, the solder film is much too thick (otherwise the joint is a good



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one). Seam (B) is best on large machines, and is least satisfactory on machines having small diameter rolls. The so-called Frama balancer welding system has helped in maintaining more uniform temperatures in both welded and soldered seams. This is essentially an acetylene valve which is operated by oxygen gas pressure, which is set at a definite point and insures a definite acetylene pressure. Both gases thus enter the mixing chamber in the right proportion for complete combustion, and the condition and size of the flame are kept constant throughout the operation. The authors also discuss the causes of failures in soldered seams, which have been partly remedied by using the Frama burner. H. H. Parrett. The Paper-maker and Brit. Paper Trade J. (T.S.) 93, 82-4 (1937).

◆ Variations in Printing Inks

The article discusses the (climatic) influence of light, heat and moisture. The effect of sunlight under varying conditions is compared with that of a light from a quartz lamp. Dyestuffs in different inks vary greatly, and the thickness of the inks is also of marked importance. Nitrocellulose lacquers are very useful as protective films. Chemical influences include mill gases, gases from combustion, and vapors from evaporators. Lead and sulphur dyes are very sensitive. Alkaline pastes are affected by acids. The quality and condition of paper are also important. These include age, treatment of paper, and faulty sizing. The varnish and dryers in inks influence their shade (e.g. discoloration of varnish). Besides these, there are miscellaneous influences (e.g. impurities causing darkening or fading of inks on rollers; the ink duct; faulty composition of inks). The study is a comprehensive, brief monograph resulting from first-hand experience. Anon. Papier-Ztg. 61, No. 101, 1891-93; through Paper-Maker and British Paper Trade J. 93, No. 6 (T.S.) 85 (1937).

◆ Tannin in Colored or Printed Papers

The detection of tannin by Haller's so-called infallible method fails when the papers contain dyes that are difficult or impossible to reduce. Examples of such dyestuffs are Victoria Blue B, Ethyl Violet, Crystal Violet, and the Rhodamines. When these are present, the following procedure is recommended: Five to 10 grams of the paper are extracted with boiling alcohol, and the filtered extract is evaporated to a volume of 10 cc. This is treated with 0.5 per cent titanium trichloride, which causes the gradual precipitation of characteristic orange colored flocks of titanium tannate. When rosin sizing is present, the preciptate may be obscured by separated rosin. Under such conditions, the mixed precitate is filtered and washed resin-free with 70 per cent alcohol, which also removes interfering non-reduced dyestuffs. Fritz Burgstaller. Papierfabr. 35, (Tech. Teil) 128-9; Wochbl. Papierfabr. 68 (Tech. Teil) 298 (1937).

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◆ Surface Charges on Paper

A very comprehensive study emanating from the Institute of Technical Physics and the Institute of Paper Making at Darmstadt. In these laboratory experiments, the device used resembles the usual electrifying machines. This is shown in Figure 1. The sample to be tested is cut into the form of a disc (d) and mounted on a well insulated shaft (b), rotated by a motor at 1000 r.p.m. with a zone near its rim contacting a kid leather for 10 minutes, under such a pressure that the resulting output is 8-9 watts (regulated by a screw (f)). By means of the screw (a), (b) and

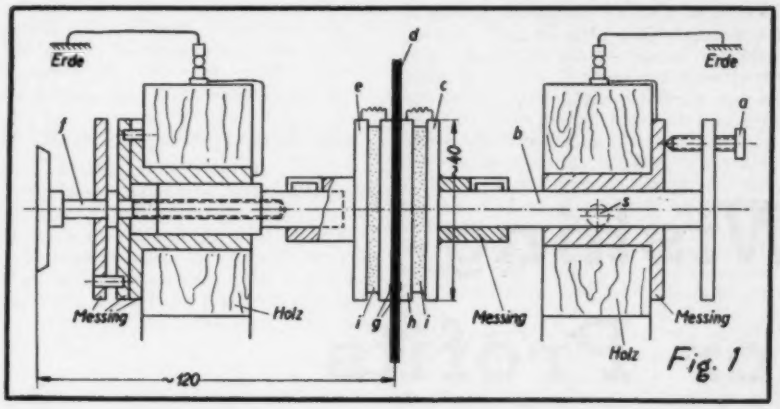

Fig. 1

frictional surfaces (e) are in the same plane as (d). By use of a set screw (s), (e) is held in position, while a finely threaded screw (f) serves to press (e) against the sample at the desired pressure. The actual leather surfaces (g) are glued to brass plates (h). The latter are carried by spongy rubber layers (i). In the illustration, the following German terms are used: Messing (brass); Erde (ground); Holz (wood). Figure 2 shows the raised insulated (trolitul insulator) screen (Abschirmung

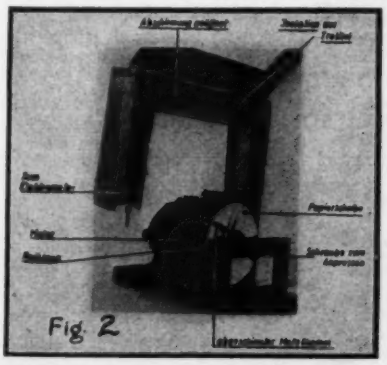
Fig. 2

geöffnet), the motor, the frictional material (Reibzeug), the paper disc sample (Papier Scheibe), and the screw for pressure regulation (Schraube zum anpressen).

The surface charges were measured by a Wulf high tension electrometer. The use of kid leather to produce surface charges was arrived at after testing other materials like hard paper, copper, silk and kraft paper. Hard paper, while giving higher charges than did kid leather, presented a less satisfactory surface. Copper gave too low a surface charge. Kraft paper gave unusually low charges, and silk proved entirely unsatisfactory. Coated papers and stuff-colored papers were tested under similar conditions of temperature and humidity, and the effects of different types of filters, loading, hardness, weight per surface area, etc. of the paper disc have been noted. Practical conditions on paper machine and conditions leading to the electrification of paper rolls were also studied. So was the effect of rotary intaglio printing presses. With paper discs, surface charges increased with increasing pressure, and with increasing speed of rotation. The reproducibility in separate experiments was very good (±) 4.1 per cent.

Surface charges are not caused by water vapor escaping from the inner parts of the paper. Primarily electrification is correlated with the relative humidity of the surrounding air. The moisture content of the paper ordinarily is of less consequence. An explanation of the high rate of de-ëlectrification in moist air is the formation of minute networks of moisture on the surface of the paper. Only through the so-called Lenard effect, in which the electrical conductivity of air is increased by atomization of water particles, does increased humidity in air cause an increase in the conductivity. Ordinarily the higher the humidity the lower the air conductivity. Atomizing of water particles thus supplies a method of de-ëlectrification. Evidently in the finished paper sample, the fiber type, loading, sizing, hardness, density, thickness, and gloss are of slight importance when it comes to surface charges, except in so far as they affect moisture content. Small amounts of NaCl prevent electrification. Paper that reaches the printing presses unelectrified may become statically charged, depending on conditions. If paper rolls carry charges before printing, the store room humidity has only a minor effect on the rate of discharge, and the moisture content of the paper plays an important part. The drier the paper, and the tighter the roll is wound, the greater is the time during which the charge is retained. W. Brecht, F. Schmid, and R. Vieweg. Papier-Fabr. 35, Tech Tl. 133-40, 142-59 (1937).

◆ Dioxane Pulping and Lignin Composition

When spruce wood is delignified at 90 degrees C with dioxane containing HCl, and when the dioxane extract is precipitated with ether, the resulting product (depending on the acid concentration) varies from 16 to 23.7 per cent crude lignin. The amount of acid used was .12 per cent — 0.75 per cent of concentrated HCl based on dioxane. This crude lignin contained from 57—61 per cent C, 5.6—6.4 per cent H, 12.1 to 13.8 per cent methoxyl, and 16 per cent pentosans, and was in part soluble in hot water (about 37 per cent of the total weight). The aqueous solution contains reducing sugars and some methoxyl derivatives. The residual lignin, which contains about 15.5 per cent methoxyl was retreated with hot 5 per cent H_2SO_4. This causes an additional loss of 4 per cent, and the lignin residue then contains 16.3 per cent methoxyl, and is more or less soluble (depending on conditions) in cuprammonium solution and in aqueous ammonia. When reprecipitated from these solutions a lignin is obtained which contains 63.1 per cent C, 5.8 per cent H and 14.9 per cent methoxyl. This composition approaches that of Willstätter's lignin (64.5 per cent C, 6.0 per cent H, 14.9 per cent methoxyl).

These data are refutations of Hilpert's claim that lignin does not pre-exist in wood, since it is difficult to explain how 0.12 per cent of HCl and 42 per cent HCl (the latter used in isolating Willstätter's lignin) give substantially the same product especially as Hilpert admits that 0.12 per cent HCl does not exercise a degradation of the sugars. Isolated Willstätter lignin is soluble in dioxane containing HCl. In another study the same authors subjected spruce sawdust to successive treatments with (a) (cold 1.0 N NaOH, (b) Schweizer reagent, and (c) boiling methanol. These extractions were repeated six times. NaOH and methanol yielded practically no material, but when Schweizer's solution was acidified, a precipitate of 36 per cent of the original wood was obtained. This contained some methoxyl derivatives, and the total woody residue after the successive treatments amounted to about 50 per cent. Roughly 25 per cent of the total methoxyl derivatives were dissolved by the various extractions. The original wood contained 49.8 per cent C, 6.15 per cent H, and 5.05 per cent methoxyl. The woody residue, after extraction contained 51.5 per cent C, 5.1 per cent H, and 7.45 per cent methoxyl. The authors have calculated that the original wood must contain a component with approximately 62 per cent C (i.e. lignin). When beechwood was extracted at 90 deg. C with dioxane (and 0.12 per cent HCl) and this extract was precipitated with ether, a yield of 19.3 per cent raw lignin was obtained. This contained 53.6 per cent

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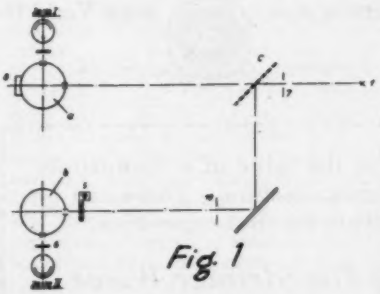
C, 5.8 per cent H, and 16.3 per cent methoxyl. Here also boiling with water caused a loss of 37.4 per cent and the residual product contained 60.3 per cent C, 6.2 per cent H and 20.9 per cent methoxyl. This compares favorably with the composition of Willstätter lignin from beech (60.7 per cent C; 5.2 per cent H, and 17.7 — 20.9 per cent methoxyl).

When the crude lignin is dissolved in cuprammonium solution, and precipitated with acid, the precipitate has a composition approaching closely that of Willstätter lignin. The substances dissolved by water treatment of crude lignin are composed of approximately 50 per cent of pentosans. Methoxyl derivatives are also present, but methyl-pentosans are absent. This work also seems to discredit the Hilpert hypothesis. N. I. Nikitin, I. M. Orlowa, and M. Awidon. Berichte 69, 2434—43 (1936) through Papierfabr. 35 (Abstracts) 75-76 (1937).

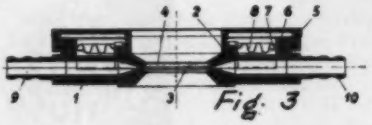
◆ New Optical Paper and Pulp Testing Instruments

The leucometer is a photoelectric instrument for measuring whiteness and is much more sensitive than the sphere reflectometer used in conjunction with the Pulfrich photometer. Its inner construction is shown in Figure 1. The light is divided at (c). One part falls upon



the sample (8) through a suitable opening in the so-called Ulbricht sphere (a), while the other part of the light passes through a measuring diaphragm (5) into the comparator sphere (b). In a direction at right angles to that of the entering light, each sphere has an opening through which photoelectric cells (I) and (II) are illuminated. In front of these cells

are placed various, changeable filters (6). For every pair of filters there is a diaphragm through which the differences in the color sensitivity of the two cells may be compensated. The intensity of the light falling on cell (I) is directly proportional to the light reflected by the sample (8). Cell (II) is illuminated through (5) to the point at which the current in (II) compensates that of (I). An electrometer serves to indicate the equality of the currents in these cells (i.e. it gives the zero reading). The instrument is based on patents of the Norwegian Paper Research Institute in Skoyen near Oslo, and will soon be placed on the market. Another instrument is shown in Figures 2 and 3. It is a chamber through which layers of beater suspensions can flow and be microscopically



examined. These layers may be altered at will. The chamber may be clamped to a microscope table. One of the feed pipes (9 or 10) is connected directly to the beater. The glass plates (3 and 4) serve to limit the thickness of the layer under observation, and this thickness may be varied from 0.2 mm. to 1.5 mm. A stopcock serves to interrupt the flow at any desired instant for microscopic observation. A third instrument (not shown in the illustrations) is termed the ultraphot which is a universal apparatus for microscopy and photomicrography, while a fourth (also not illustrated) is a spectrographic instrument for qualitative and quantitative chemical analysis of various papermaking materials. O. Neese, Papier-Fabr. 35, Tech. Tl. 177-8 (1937).

◆ ◆

◆ THE AMERICAN ENGINEERING COMPANY announces the removal of its Cincinnati office from 801 Chamber of Commerce Building to 1112 in the same building. W. S. Major is in charge of the Cincinnati office.

◆ Unemployment Laws in Forty-five States

As of June 1, 1937, 45 states, the District of Columbia, Alaska and Hawaii have enacted unemployment compensation laws and all the laws except those of Delaware and Hawaii have been approved by the Social Security Board. The Delaware and Hawaii laws will probably be reviewed by the board shortly. The latest available statistics indicate that 18,633,000 workers are employed in jobs covered by the 45 approved states. Current estimates for Alaska are not available.

By May 15, 1937 the unemployment trust fund in the United States Treasury amounted to $253,970,891. This represents deposits, plus accrued interest, of 34 states and the District of Columbia. Wisconsin, the only state which has begun benefit payments, had withdrawn $1,000,000 for this purpose.

◆ INCORPORATION OF THE Port Renfrew Pulp and Lumber Company, Ltd., which recently established a new pulp plant at Port Renfrew, B. C., has been announced from Victoria. The firm's registration papers show it with capitalization of $355,000.

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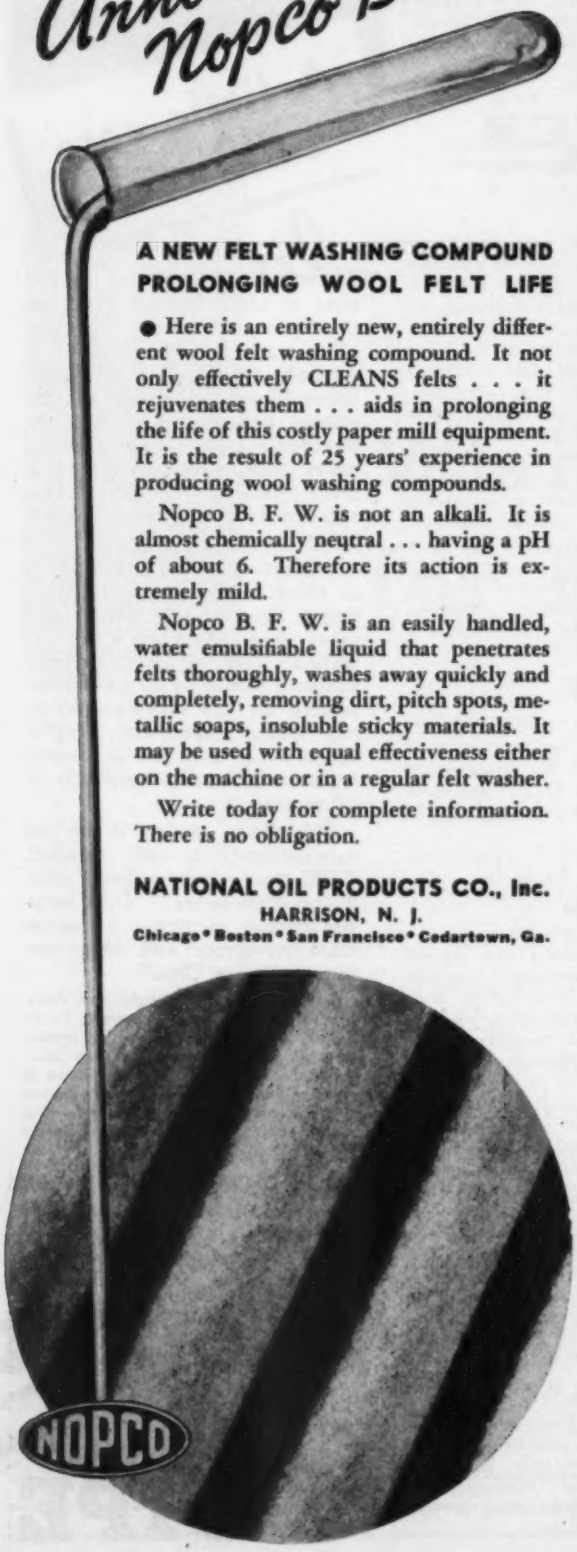

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PAPERMAKING PATENTS

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Inquiries with reference to any of these patents should be addressed to James Atkins, Munsey Building, Washington, D. C.

Compiled by James Atkins, Registered Patent Attorney

2,077,436—Paper Manufacture. Harold Robert Rafton, Andover, Mass., assignor to Raffold Process Corporation, a corporation of Massachusetts. No drawing. Application April 14, 1932. Serial No. 605,347. 34 Claims. (Cl. 92—40.) The step in a method of manufacturing paper filled with alkaline filler comprising adding in the paper-making process prior to the passage of the web from the web-forming device a dry mixture of alkaline filler and at least one member of a group of papermaking ingredients which include size and acidic material, the alkaline filler being present substantially in excess in respect to the chemical equivalent of any acidic ingredient.

2,077,614—Papermaking Machine. William Boyd Campbell, Montreal, Quebec, Canada, assignor to Harry John Rowley, Quebec City, Quebec, Canada. Application November 21, 1935. Serial No. 50,975. 1 Claim. (Cl. 92—43.) A paper web forming apparatus comprising a rotatable drum, the central portion of the drum's periphery including a foraminous covering adapted to have pulp suspension placed thereon, shallow compartments adjacent to one another and immediately underlying the foraminous covering, terminal chambers disposed along the drum surface at the edge of said drum and communicating with the compartments disposed below the foraminous covering, the peripheral wall of each terminal chamber being radially further from the centre of the drum than the foraminous covering, at least one suction header positioned at an end of the drum and communicating with the terminal chambers, whereby upon the application of suction through said header the liquid constituent of the deposited pulp suspension may be withdrawn therefrom through said compartments, chambers and suction headers.

2,077,726—Apparatus for the Manufacture of Coated Paper. Diong D. Uong, Fitchburg, Mass., assignor to Fitchburg Paper Company, Fitchburg, Mass., a corporation of Massachusetts. Original application April 1, 1933. Serial No. 663,966. Divided and this application August 17, 1935. Serial No. 36,623. 4 Claims. (Cl. 91—43.) A powder-applying mechanism for a paper-making machine comprising a casing, a hopper mounted thereon, and feeding devices for said powder comprising a pair of adjacent and substantially posite sides of said hopper, means to reciprocate said plates longitudinally, said plates being inclined relatively to each other, and means to adjust said plates in the planes thereof to vary the powder delivery opening between said plates.

2,077,816—Doctor for Papermaking and Like Machines. Frederick William Vickery, London, England. Application January 18, 1936. Serial No. 59,718. In Great Britain January 16, 1935. 8 Claims. (Cl. 92—74.) A doctor comprising a flexible blade, a holder provided with a longitudinal groove for receiving the rear edge of the blade, said blade having retaining portions provided with a surface transverse to the side face of said blade adjacent the rear edge thereof, a member extending longitudinally of the holder mounted in a portion of said groove and shiftable relatively to said holder, and blocking means asvertically grooved plates mounted at opsociated with said member, said blocking means being displaceable, upon shifting said member, from a position to engage with the transverse surface of said retaining means and block lateral removal of the blade from said holder to a position out of engagement with said retaining means to permit lateral removal of the blade from the holder.

2,077,998—Multiply Latex-Treated Paper. Ferdinand W. Humphner, Oak Park, Ill., assignor to Mid-States Gummed Paper Co., Chicago, Ill., a corporation of Illinois. Application January 14, 1935. Serial No. 1.785. 3 Claims. (Cl. 154—43.) A gummed paper tape comprising an inner ply of paper impregnated with rubber deposited from latex, outer plies of paper secured to said inner ply but having external surfaces devoid of said rubber, and a water-soluble adhesive on one of said external surfaces.

2,078,030—Method and Apparatus for Beating Paper Pulp. Walter N. Sherwood, North Hoosick, N. Y. Application September 10, 1934. Serial No. 743,318. 9 Claims. (Cl. 92—25.) A paper pulp beater comprising a tub having an upwardly extending rear portion provided with a curved ceiling adjoining the rear wall of the tub, a beater roll rotatably mounted in the tub and extending across the width of the same, a bed plate arranged below the beater roll, a dam member pivotally mounted forwardly of the beater roll and operable to convey the paper pulp in the form of a flowing sheet to the beater roll, a guide plate arranged to the rear of the beater roll for directing the paper pulp discharged from the roll upwardly and rearwardly against the curved ceiling of the tub, the bottom of the tub being inclined downwardly toward the front and being connected to the rear and forward walls by ascending curved portions.

2,078,218—Intercepting Member for Paper Stock Treating Machines. Archer Le Roy Bolton, North Andover, Mass., assignor to John W. Bolton & Sons, Inc., Lawrence, Mass., a corporation of Massachusetts. Application November 26, 1934. Serial No. 754,801. 9 Claims. (Cl. 92—22.) The combination with a paper stock treating roll, of stock treating metal blades which extend radially outward from the surface of the roll in planes which are parallel with the axis of the roll so as to form an annular set of longitudinal pockets, one surface of each blade being substantially smooth and another surface which forms a wall of a pocket being formed with integral projecting longitudinal ribs.

2,078,222—System of Fiber Liberation. Charles D. Altick, Lloyd D. Smiley and Edward T. Turner, Dayton, Ohio, assignors to Pulp Process and Development, Inc., Dayton, Ohio, a corporation of Ohio. Application March 12, 1934. Serial No. 715,150. 36 Claims. (Cl. 92—7.) In an apparatus for treatment of pulp making material, a soak tank for preparation of material, a digester tank for the reduction of the prepared material, a circulatory conduit for an intermixture of material and liquid leading from one end of the soak tank and discharging into the opposite end thereof, a second discharge connection from said circulatory conduit to the digester tank, a circulatory conduit for an intermixture of material and cooking liquor leading from one end of the digester tank and discharging into the opposite end thereof, and a circulatory conduit for cooking liquor leading from one end of the digester tank and discharging into the opposite end thereof in reverse relation to the direction of circulation of the intermixture of material and liquor, and means for effecting circulation of material and liquor through the respective conduits.

2,078,715—Oscillating Mechanism for the Oscillating Wires or Sieves of Papermaking and Other Machinery. Klemens Lurz and Karl Schönemann, Heidenheim-on-the-Brenz, Germany. Application November 9, 1934. Serial No. 752,300. In Germany November 13, 1933. 3 Claims. (Cl. 74—61). Means for angularly adjusting, in oscillating mechanism for the oscillating wires or sieves of papermaking or other machinery, one gyrating mass relative to the other, comprising in combination a hollow shaft, a gyrating mass fixed to and another gyrating mass loose on said shaft, a spindle formed with high pitch threading extending in said shaft, a nut on and meshing with formed, said mold having pores of finer said spindle, one of said meshing parts being coupled with said loose mass for rotation in common, and means for axially displacing other meshing part.

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The PAPER INDUSTRY

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2,078,810 — Apparatus for Continuous Treatment of Wood Pulp and the Like with Chemicals. Johan Cristoffer Fredrik Carl Richter, Oslo, and Karl Wilhelm Rosén, Svelvik, Norway, assignors to Aktiebolaget Kamyr, Oslo, Norway. Application February 20, 1935. Serial No. 7,454. In Norway January 12, 1934. 5 Claims. (Cl. 8—2.) An apparatus for treating material with chemicals, comprising a tank, the bottom of to said baffle, and resilient positioning means for biasing each pair of segments into contact engagement with said movable rod contact in the closed circuit position and into clamping engagement with said conducting means.

2,079,390—Work Holding and Safety Device for Paper Cutting Machines. Daniel M. Winans, Binghamton, N. Y. Application November 1, 1934. Serial No. 751,008. 8 Claims. (Cl. 164—59.) In combination with a support for holding a stack of articles to be cut, a guide member against which said stack may be placed for alignment, suction means provided through said guide member for holding said stack in adjusted position against said guide, and means on said guide for adjusting the suction means in accordance with the height of the stack.

2,079,667—Pulp Molding. George W. Swift, Jr., Bordentown, N. J., assignor to George W. Swift, Jr., Inc., Bordentown, N. J., a corporation of New Jersey. Application March 13, 1935. Serial No. 10,789. 7 Claims. (Cl. 92—54.) An apparatus for forming wet pulp articles of irregular contour, having a receptacle containing a thin pulp suspension in water of the character described, a housing having a vacuum chamber, a mold of porous stone-like material forming part of the walls defining said chamber and having one of its faces exposed to said chamber, and its other face recessed to conform to the shape of the article to be size adjacent certain recessed portions thereof, the last mentioned face of the mold being immersed in said liquid suspension of the pulp, whereby pulp will be progressively drawn from the suspension and deposited in sheet form on the last mentioned face of the mold, by the vacuum action of the chamber, with relatively reduced deposit of pulp on said last above mentioned portions of the mold. The method of forming wet pulp articles of irregular contour from a thin liquid suspension of the pulp of the order of 98 per cent water and 2 per cent pulp, which comprises immersing an irregular face of a porous body of stone-like material in a supply of said suspension, and simultaneously exposing another face of such body to the action of a vacuum whereby pulp will be progressively drawn from the suspension and progressively built up in a sheet of substantially uniform thickness on the first mentioned face of the mold, with the outer face of the sheet in contact with the supply of pulp-in-water suspension, in accordance with the amount of water drawn through the mold by the aforesaid vacuum action.

2,081,320 — Doctor Blade for Rolls, Traveling Webs, and the Like. James Roy Burgess, Toronto, Ontario, Canada, assignor to Canadian Wallpaper Manufacturers, Limited, Toronto, Canada. Application August 10, 1935, Serial No. 35,616. 1 Claim. (Cl. 91—18). In a doctor, the combination of a pair of rigid retainers, a glass blade mounted between said retainers and extending beyond the forward edge thereof, resilient packing between each face of the blade and the adjacent retainer, and means for securing said retainers and blade together, and spacing means between said retainer for limiting the compression of the packing.

2,081,456—Paper Making Apparatus. Charles W. Howard, Franklin, Ohio, assignor to The Black-Clawson Company, Hamilton, Ohio, a corporation of Ohio. Application July 11, 1936, Serial No. 90,196. 15 Claims. (Cl. 91—55). Apparatus for removing water and the like from a web of waxed paper comprising means for guiding the web in a downward direction, and a series of shaving blades having water guiding surfaces inclining downwardly and away from the web at a small angle for effective mechanical separation of the water by a combined gravitation and shaving action.

2,082,411—Paper Cleaning Device. Carle J. Merrill, Portland, Maine. Application August 20, 1935, Serial No. 37,086. 5 Claims. (Cl. 15—14). In a machine for cleaning the surface of a travelling web of paper, the combination with air pressure and air suction cleaning mechanism arranged so as to operate on both sides of said web, of two rolls for guiding the continuously moving web of paper, means for maintaining these rolls in a fixed position relative to each other and means to move both rolls and the moving web of paper into proximity to but out of contact with the air pressure and air suction cleaning mechanism, whereby both sides of the paper web may be cleaned.

2,083,206 — Safety-Paper. Walther Schoeller, Duren/Rhineland, Germany. Application February 8, 1935, Serial No. 5,560. In Germany February 8, 1934. 11 Claims. (Cl. 154—46). A safety paper including a layer of paper having incorporated therein metal salts, and a second layer of material containing a chemical substance capable of reacting with said metal salts to form a visible product coloured differently from said layer of paper and said layer of material, said paper layer being attached to said layer of material by an intermediate layer of an adhesive substance, which swells readily upon the action of liquids, said intermediate layer being adapted normally to separate said metal salts and said chemical substance from contact with one another but adapted, when the safety paper is treated with liquids, to permit said metal salt and said chemical substance to come into contact and react with one another to form said visible coloured product.

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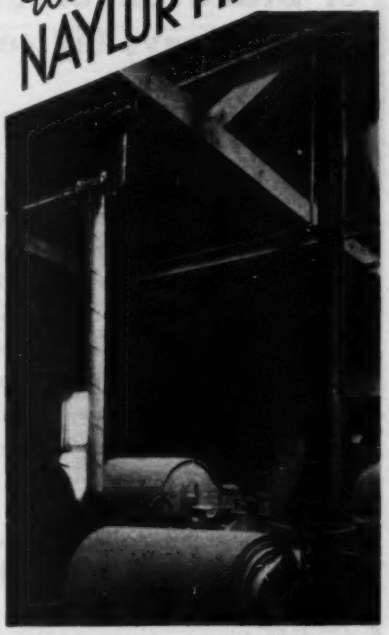

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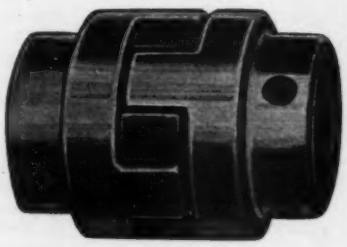

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The COMMERCIAL OUTLOOK

New York, August 2, 1937.

THE summer lull in the paper market continues and yet there is common agreement within the trade that that industry is characterized by broader aggregate activity than at this period for some years, or since prior to the depression. Buyers generally are proceeding cautiously in adding to their present stocks or augmenting forward commitments, as is their usual wont in midsummer, but there is a certain volume of business in paper and board which is developing steadily and which lends a fairly lively atmosphere to the market. Opinion in the industry is that excellent business will be seen in the fall, that over the next few weeks demand will open up again and assume wide dimensions, leading to market conditions which will compare most favorably with, if not actually surpass, the brisk situation enjoyed last fall and winter.

Mills are keeping moderately busy producing and shipping against contracts, as well as the sizable backlog of orders accumulated early in the year. In some few instances, definite indications of the large expansion of business expected during the latter months of 1937 have come to the surface in actual requisitions from consumers, converters or jobbers who evidently are aiming to get the jump on the anticipated increase in market activity which almost invariably follows the summer quiet spell. Thus, while the seasonal slackness is still prevalent, it can be said the condition of the paper and board industry is far from dull.

Statistically, paper and board manufacturing is in a very healthy position, and new high records of production in recent months continue to be disclosed. Production of newsprint paper in Canada during the first half of the current year reached 1,783,350 tons, a rise of 293,244 tons or 19.7 per cent over the corresponding period last year for a new all-time high. United States newsprint output in the first six months of this year amounted to 470,036 tons, a gain of 9,908 tons or 2.2 per cent above a year ago. Newfoundland production rose 24,435 tons or 15.8 per cent to 178,949 tons in the six months, making a total North American output of 2,432,335 tons, an increase of 327,587 tons or 15.6 per cent contrasted with the first half of 1936.

June newsprint production in Canada amounted to 310,871 tons, and shipments from mills were 311,507 tons. United States mills produced 78,500 tons in June, and shipped 76,255 tons, making a total combined Canadian and United States output in June of 389,371 tons and total shipments of 387,762 tons. North American production aggregated 419,183 tons, an increase of 40,674 tons over the 378,509 tons manufactured in June last year, according to News Print Service Bureau figures. At the close of June stocks of newsprint at Canadian mills were reported as 67,438 tons, while United States mills held stocks of 14,944 tons, making a combined total of 82,382 tons, as against 80,773 tons at the end of the preceding month, and comparing with 93,628 tons on the corresponding date a year ago.

Figures from Canada show that Canadian mills shipped a total of 1,740,721 tons of newsprint in the first half of 1937, a gain of 20.4 per cent over 1,445,483 tons shipped in the similar time last year. Shipments to the United States were 1,382,813 tons this year, against 1,114,277 tons in the same six-month period last year, a rise of 24.2 per cent, while to overseas markets the gain was 7.1 per cent, with volume at 257,526 tons as compared with 240,473 tons.

The monthly index of newspaper advertising registered an increase of 4 per cent during June over the same month a year ago and a rise of 3.9 per cent over May this year, according to Printers' Ink.

Production of paperboard in the United States in May amounted to 408,497 tons, according to the Census Bureau's monthly summary, comparing with 418,665 tons in the preceding month and 289,527 tons in the same 1936 month. Output during the first five months of the current year totaled 1,994,764 tons, constituting a large increase over 1,413,000 tons produced in the similar period of 1936, and a larger gain over 1,312,980 tons in the same 1935 time. The production in five months of this year is believed to have set a new high record.

Board mills produced at 90.7 per cent of their rated capacity during May last, against 92.8 per cent in April this year and 71.0 per cent in May a year ago. During the first five months of the current year, production was at an average of 89.5 per cent of mills' capacity, compared with 68.8 per cent in 1936, and 65.5 per cent in 1935. New orders for paperboard received by manufacturers in May last called for a total of 356,687 tons, contrasted with 404,108 tons in the month before and 280,899 tons in May, 1936. Unfilled orders held by mills at the end of May were for 154,379 tons of board, against 200,833 tons a month earlier and 92,784 tons on the corresponding 1936 date.

Shipments of prepared roofing from manufacturing plants in the United States amounted to 2,516,861 squares of all types of roofing in May, compared with 2,423,178 squares in April last and 2,097,357 squares in May last year, according to the Census Bureau's report. Five months' shipments this year aggregated 13,243,810 squares, against 12,086,339 squares in the similar period of 1936, and 9,792,511 squares in the first five months of 1935.

◆ ◆

◆ Line of Inks in Tubes Introduced by IPI

Printing inks are now available in tubes as well as in cans through the introduction of the new line of "Everyday" inks by the International Printing Ink Corporation who backs up its new tube feature by a "money-back guarantee."

According to IPI officials, marketing ink in tubes reduces waste by eliminating the possibility of "skinning" losses by evaporation. They assert that ink in tubes is convenient to use, especially on small jobs and in smaller printing plants. The inks come in eleven colors, whites, blacks and compounds and the tubes and cans are printed to match the inks they contain, so making identification simple.

◆ Six Months Period Shows Gain at Container Corporation

In the first six months of the year the tonnage and dollar shipments of the Container Corporation of America were respectively 11.6 per cent and 33.6 per cent greater than the first half of 1936. During March, April and May of this year the company experienced its largest volume of business and highest earnings in its history.

Since the first of the year, funded debt was reduced by $351,000. The building machinery and equipment account was increased by $535,618 and decreased by additional reserve for depreciation of $607,490 or a net decrease of $71,872. The construction in progress account was increased by $2,050,471. Thus far, there has been spent on the new mill at Fernandina, Fla., $653,836 of which $66,144 had been spent prior to January 1. The additional outlay for the completion of the pulp mill is estimated to be about $2,100,000.

◆ L. C. McMURTY of the Horton Steel Company, Fort Erie, Ont., was recently selected as chairman of the Niagara Peninsula Branch of the Engineering Institute of Canada. C. G. Moon of the Ontario Paper Company, was the choice for vice-chairman.

◆ THE AMERICAN ENGINEERING COMPANY, Philadelphia, Pa., has appointed the Sabin Engineering Company, Cleveland, Ohio, as their representative in that territory.

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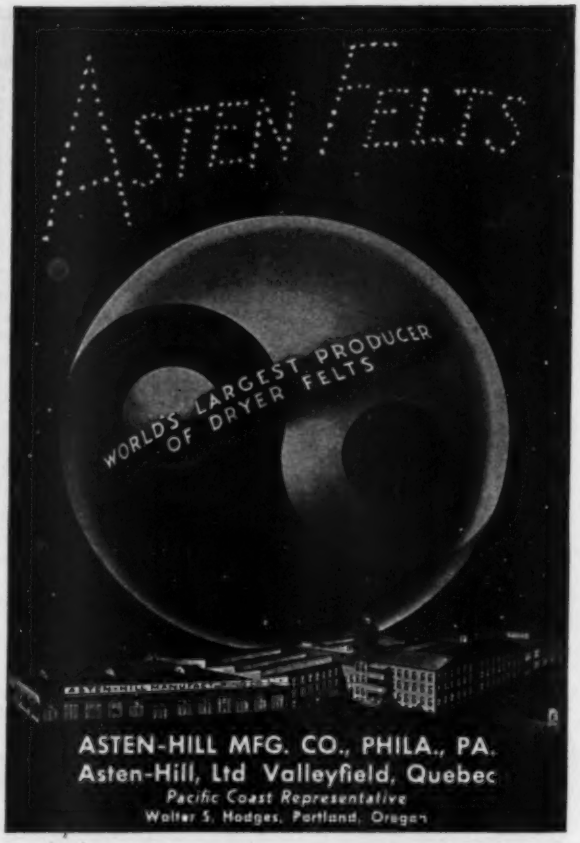

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PAPER & PULP SECTION NATIONAL SAFETY COUNCIL TWENTY NORTH WACKER DRIVE CHICAGO ILL.

Domestic RAW MATERIALS

◆ Papermaking Rags

Notwithstanding that consuming mills are lending very little support to the market, as is usually their wont at midsummer, while apparently being supplied against present requirements, papermaking raw materials are developing a distinctly firmer undertone and the slight fluctuations registered in prices recently have been in an upward course in most cases. The strengthening of the market apparently is due to dealers and importers expecting a revival of mill buying in the near future, after a period of very restricted purchasing and probably higher price levels.

The situation in roofing and other papermaking rags provides an apt illustration. There is limited current demand from consumers for rag stock, fine paper manufacturers, roofing felt producers and others absorbing supplies only in light volume and in strict routine fashion, yet prices of rags are characterized by a decidedly firmer undertone and in quite a few cases available stocks are held at somewhat higher asking figures. There has been no mill purchasing of roofing rags of any importance recently, but market price levels have moved at least slightly upward and it is questionable whether sizable quantities could be obtained even at the rates dealers and importers now mention as asking prices.

Domestic roofing rags are quoted in the East at 1.40 cents or thereabouts per pound f.o.b. shipping points for No. 1 classification stock, and 1.15 to 1.20 cents for No. 2 roofing stock. Many dealers would not sell at these prices while evidently satisfied to wait out the market in the confident belief they will be able to secure higher values later on. The claim is that rag collections have fallen off materially, with the result fewer roofing rags are reaching the market, and this is advanced as a factor likely to lead to higher prices when consuming mills resume buying on a larger scale as they ordinarily do in the autumn. Foreign roofing stock is priced far in excess of domestic rags; in fact, at well above a normal parity, as importers say it is difficult to buy abroad in competition with other consuming markets at any cheaper costs. Foreign dark cottons, which correspond with our No. 2 domestic roofing rags, are quoted at 1.80 cents a pound or higher ex dock American Atlantic ports, and foreign linsey garments at 2.10 cents or more a pound.

Demand from Europe for some grades of new cotton cuttings is growing to constitute an important factor in this division of the papermaking rag market. There is no doubt that the bulk of sales of white shirt cuttings and some additional grades in recent months has been for export instead of to domestic paper manufacturers. Moreover, this foreign demand seems to have come to stay, as the needs of consumers abroad appear insatiable. New York dealers exhibit scant disposition to sell No. 1 new white shirt cuttings at less than 8.75 to 9 cents per pound f.o.b. shipping point, while new soft unbleached muslins are held at 9.25 to 9.50 cents, fancy shirt cuttings at 3.50 cents, new blue overall cuttings at 7.50 cents, bleached canton flannels at 8.50 cents, black silesias at 4.50 cents, light silesias at 6.75 cents, white canvas cuttings at 8.75 cents, new white linens at 12 cents and grey linens at 11 cents.

Old white cottons also are being shipped abroad in good volume and are quotably firm at 3.75 cents to higher per pound at dealers' shipping points for No. 1 repacked whites. Old blue cottons are relatively slow moving at price levels of around 2.15 cents a pound for repacked twos and blues and 1.90 cents for repacked twos and blues.

◆ Old Paper

After receding to new low levels—the lowest recorded in a long while—in early July, prices of old paper have firmed and have regained some of their decline, especially as concerns the low grades. It is the contention of packers that the sinking of prices to uncalled for low levels resulted in a appreciable decrease in collected supply, and that the market now is feeling the effects of the smaller available tonnage of material. Furthermore, the export of waste paper is increasing, and is having influence of bullish character on the market along the Atlantic seaboard. Dealers report there is a persistent inquiry from several European countries for waste paper supplies, and that large tonnages could be readily marketed abroad were the ship space to be had for transportation across the Atlantic. As it is, it is said considerable stock is being shipped out of the country.

Dealers in the East ask 40 cents or higher per hundred pounds for No. 1 mixed paper f.o.b. shipping points, 50 cents for folded news, and 65 cents for old corrugated boxes. Beyond these prices is frequently quoted. Hard white shavings are reported bringing 2.60 to 3 cents a pound, according to quality, f.o.b. dealers' points, soft white shavings 2.25 cents for ordinary and 2.65 cents for one-cut grade, No. 1 hard white envelope cuttings 3 to 3.10 cents, new manila envelope cuttings 2 cents, white ledgers 1.75 cents, colored ledgers 1.60 cents, No. 1 old kraft 1.50 cents, white news blank cuttings 1.50 cents and No. 1 book stock 95 cents per hundred pounds.

◆ Rope and Bagging

Paper manufacturers are buying very little old rope or scrap bagging, yet quoted prices adhere to maintain levels. Old manila rope is 4.50 cents per pound f.o.b. shipping points for No. 1 domestic, and this same price or close to it ex dock New York for No. 1 foreign. Bagging for papermaking is quoted at around 1.75 cents a pound at shipping points for No. 1 domestic scrap, 2 cents or higher for imported material, and a cent per pound for domestic roofing bagging.

◆ Pulpwood

Sellers are experiencing no difficulty in disposing of pulpwood, and, in fact, doubtless could market much more wood if they had it to offer. The price tone is firm and the tendency of the market is upward.

◆ Mechanical Pulp

Mechanical pulp is moving freely into consuming channels against contracts and old orders whereas current demand is reported of scant consequence, users having retrenched noticeably in their purchases while presumably having their requirements provided for at present. There is no pressure to sell, however, seemingly for the reason that producers have limited tonnage to divert to the open market. Domestic and Canadian prime moist groundwood is quoted at $37.50 per short ton delivered at consuming points in northern United States, and so far as has been ascertained no producers have digressed from this price basis. There are those within the industry who expect to see groundwood prices mount to a substantially higher level later in the year or as water conditions lead to a broader outside market demand.

◆ Chemical Pulp

Domestic manufacturers of chemical wood pulp are well sold up; practically all of them, as a matter of fact, are outsold completely for some time ahead, and there is very little supply obtainable in the open market—virtually none at the established contract prices prevailing on sulphite pulps, bleached and unbleached. Thus, while the market is quiet insofar as concerns current business, the undertone is strong and there is no evidence of pressure to sell. Contract bases on sulphite grades announced for the third quarter period remain, and domestic bleached soda pulp continues at 3.15 cents a pound delivered paper mills to contract buyers. Domestic kraft pulp is 3.25 to 3.50 cents f.o.b. pulp mills for prime northern kraft.

◆ Chemicals

Papermaking chemicals are moving freely against contracts, and at steady prices. Brimstone is $18 per long ton on sizable orders to contract buyers, f.o.b. mines, and $21 for spot carload lots. Special papermaking starch is quoted at 4 cents a pound, packed in bags, at works.

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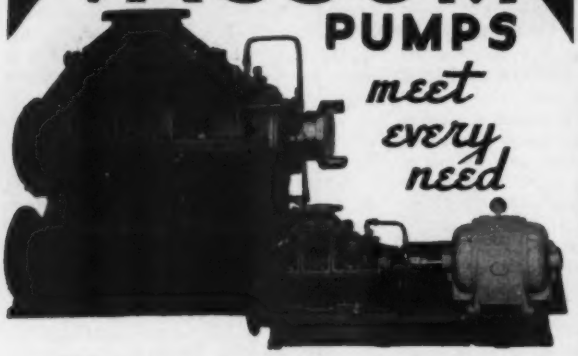

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

After several months of quiet market conditions, during which consumers with only a few exceptions have kept out of evidence as buyers, one thing stands out boldly in the imported wood pulp situation and that is producers abroad not only are not by any means pressing to sell pulp but are actually naming higher prices when requested to quote on further tonnages for forward shipment from producing sources. In short, the market undertone is stronger even than it was, notwithstanding that demand has let down to such a degree that, as far as current business is concerned, there is little doing in the market.

When the statistical position of wood pulp is taken into due consideration, this market situation is not at all confounding. Pulp producers outside the United States—and within our own boundaries, too, for that matter—are so well sold up and for so considerable a period ahead that they have little of their product to dispose of, and therefore have nothing to worry over or to cause them to seek to effect sales. Kraft pulp, it is shown by the statistics available, is completely outsold for this year, as it has been for some while, and 80 per cent or thereabouts outsold for next year. Sulphite, bleached and unbleached, is in about the same sold up position. Also, producers in Scandinavia and elsewhere in Europe are faced with a world demand for pulp—even though the United States has for the time being let down in purchasing—which they are finding difficult indeed to satisfy. Moreover, consuming markets other than the United States are so hungry for pulp supplies they are bidding prices which net producers a better return than when sales are made to America. Therefore, there is no disposition to sell here such tonnage as remains available at production centers; rather European pulp manufacturers are inclined to temporarily neglect the United States market while directing the pulp they have for sale to other more profitable markets, and do not hesitate to quote advanced prices when receiving inquiries from our consumers.

On the other hand, the quietness of the market here has led to a softening of the spot undertone, as likely would be expected, and it is no secret that resale lots of pulp have come out recently at prices representing recessions in market levels. Kraft and unbleached sulphite have been principally involved in this more or less local turn of events in wood pulp. Bleached sulphite rules relatively strong quotably, on spot or any other delivery position. It is reported prime kraft has been offered for resale at as low as 3 cents per pound ex dock American Atlantic ports, and unbleached sulphite at 3.25 cents. For forward shipment from abroad, about the lowest quotations are 3.50 cents for kraft for this year and 3.15 to 3.25 cents for 1938, and 3.50 cents for prime strong unbleached sulphite, with above these prices demanded in many instances.

It is nothing uncommon for producers to ask 5 cents and up to 5.25 cents per pound for prime bleached sulphite for shipment from abroad at any approximately early date, and also into next year. Sales have been definitely noted at 4.95 cents, ex dock American Atlantic seaboard. Prime easy bleaching sulphite is nominally 4 to 4.25 cents a pound, if available, while bleached sulphate pulp is quoted 4.50 to 4.75 cents for 1938 shipment from abroad.

Scandinavian groundwood is quoted at $40 to $41 per short ton for dry prime pulp, and about a dollar a ton less for moist, ex dock American Atlantic seaboard. Reports say there is some spot groundwood to be had at recessions from these prices, however.

Imports of wood pulp into the United States climbed in May, following comparatively small importations during the previous two months, due to closed navigation over the Baltic. Chemical pulp receipts totaled 191,590 short tons of 2,000 pounds, air dry weight, valued at $8,121,362, in May, according to U. S. Department of Commerce figures, contrasted with 108,625 short tons of a value of $5,114,937 in the month preceding, and 148,840 short tons valued at $5,844,657 in the same 1936 month. The May arrivals brought the total for the first five months of this year up to 833,903 short tons, a gain of 15.7 per cent above 720,463 tons imported in the corresponding 1936 period.

Mechanical pulp imports in May amounted to 21,484 short tons of a value of $453,141, against 19,669 tons of a value of $363,712 in April this year, and 19,140 tons of a value of $349,705 in May a year ago, and made a total for the first five months of the current year of 90,371 tons, compared with 80,345 tons in the same time last year.

◆ Paper Stock

Imports of rags for papermaking during May were less than in the preceding month and also the corresponding 1936 month, declining approximately 25 per cent compared with either of the two previous months. Imports of other paper stock were 12 per cent larger than in May last year, but were nearly 20 per cent under the volume of April, 1937, receipts. Total imports of paper base stocks in May last were valued at $9,906,257, according to U. S. Commerce Department figures, comprising 213,074 tons of wood pulp valued at $8,574,503; 73,350 cords of pulpwood of a value of $644,859, and 17,816 tons of rags and other paper stock valued at $686,895.

◆ Paper

Imports of paper and paper manufactures into the United States during May reached a total value of $11,576,938, an increase of 5 per cent over the preceding month and 13 per cent over May, 1936. Newsprint as usual accounted for the bulk of these imports, May receipts of such paper totaling 279,936 tons of a value of $10,348,263, an increase in volume of 6 per cent over both the preceding month and the corresponding month of 1936. Imports of other classes of paper and board dropped off slightly, or 3 per cent, in aggregate value compared with April, but were 33 per cent higher than in May a year ago.

EXPORTS

Exports of paper and paper products from the United States continued to show an upward trend during May, according to figures released by the U. S. Department of Commerce. The aggregate value of these exports amounted to $2,981,900 and surpassed those of the preceding month by 17 per cent and were 51 per cent higher than in the similar 1936 month. While this increase compared with a year ago was due to some extent to higher prices, a comparison of those items for which weight as well as value is recorded shows an average rise in volume of 31 per cent.

Nearly all classes contributed to the gain in the May exports compared with a year ago. Among the leading items was an increase of 61 per cent in writing paper, and 47 per cent in overissue newspapers. Some of the largest increases proportionately appeared among kraft wrapping, bristols, blotting paper, filing folders, envelopes and vulcanized fibre.

Exports of paper base stocks in May for the first time closely approached exports of paper and paper products in value, reaching a total of $2,246,731, against $1,354,816 in April this year and $870,782 in May, 1936.

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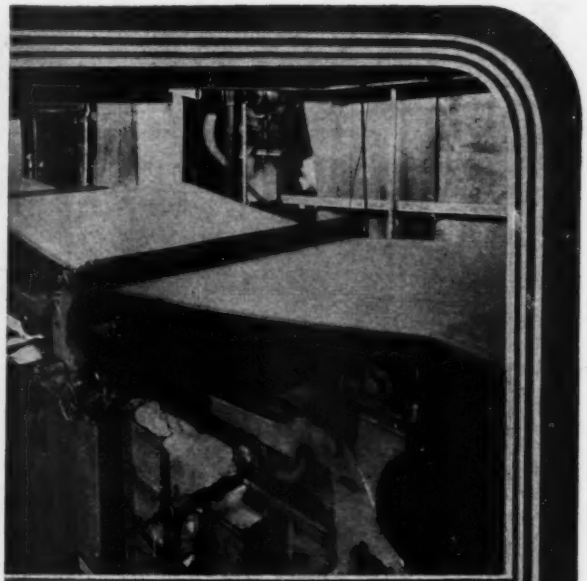

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